



Forests Commission, Melbourne, photo.

White Gums and 'Messmate' Forest.

NATIVE TREES *of* AUSTRALIA *by*

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"The Australian Bushland,"

"One of Nature's Wonderlands—The Victorian Grampians,"

"General Observations on the Australian Flora,"

"Australian Vegetation," etc.



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THE HONOURABLE
SIR ALBERT LIND, K.B., M.L.A.,

Minister of Lands and Forests

In recognition of his interest in Australian Forestry.

1124

PREFACE

FROM my early youth I have taken an absorbing interest in the Flora of my native land, and during the past thirty years have travelled extensively in all the States of the Commonwealth, to study the Flora in its native habitat, and have written and published the results of my investigations in scientific journals in England and Australia. Many friends and tree-lovers have asked me to put my knowledge of Australian Native Trees into book form.

The object of this book is to supply the general public, in a popular yet comprehensive manner, with a condensed description of the principal trees constituting the Australian forest, giving a wide and intimate view of this unique heritage and revealing the great variety, beauty, quaintness and value of the trees indigenous to Australia. Information regarding the habitat, size, form, colour, and utility of the leaves, flowers, and fruit, bark and timber, of the principal species is given. Interpretations of the scientific names and terms, and also the popular names by which the various species are generally known, are given in the text, a Glossary of botanical terms used being printed on page 381. From these descriptions a tree may be easily identified and a further aid is given by the numerous photographs and drawings.

In preparing this book I have consulted authoritative works which have been valuable to me, especially in the illustrations. These works include "Australian Plants" by W. R. Guilfoyle, "The Hardwoods of Australia" by R. T. Baker, "The Eucalypts and their Essential Oils" by R. T. Baker and H. G. Smith, "Cabinet Timbers of Australia" by R. T. Baker, "Rain Forest Trees" by W. D. Francis, "Useful Timbers of Australia" by J. H. Maiden, "Catalogue of Queensland Woods" by F. M. Bailey, "Forest Insects of Australia" by W. W. Froggart, and "Profitable Honey Plants of Australia" by Tarlton Rayment. All these are useful reference books.

Special acknowledgment is due to the Government of New South Wales for the loan of the beautiful coloured illustrations of Cabinet Timbers included in this book. Interesting photographs of Eucalypts grown in California are reproduced from the U.S.A. Bureau of Forestry's Bulletin (1902) on "Eucalypts Cultivated in the United States." The outline drawings are from "The Eucalypts and their Essential Oils," "Rain Forest Trees," and from specimens collected in Victoria.

It is hoped that this book will merit the support of all classes of readers, as it is intended for the use of the general public including timber workers, foresters, farmers, graziers, gardeners, amateurs who plant trees, schools, and all who love or are interested in our wonderful Australian Bush.



FOREWORD

It is with considerable pleasure that I write this foreword, for I know of no more interesting or fruitful study than that of the flora of this country.

In its flora Australia has been bountifully endowed by Nature; each State has its own distinctive features, and to those who roam our woodlands they are a never-ending source of satisfaction and delight. There is something about our forests that beckons us back; they have a fascination all their own. Eternal peace seems to dwell therein, and it is the one place from which the "madding crowd" is missing—the one spot where Nature reigns supreme. Perhaps that is why the call of the bush is so insistent.

No one can study the flora of this beautiful country of ours without realizing what a wonderful heritage we have.

This book should help to create a flora conscience and stay the hand of the vandals who despoil Nature's gifts.

We can no longer afford to take lightly our responsibilities, and must jealously guard our flora.

I congratulate the author of this book on the wide vision displayed, and on his undoubted achievement in compiling such a fine work. I trust it will meet with the success it deserves.

A. E. LIND,

Minister of Lands and Forests.

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INTRODUCTORY

AUSTRALIA, as we found it, was one of the best endowed lands as regards the amount, variety and usefulness of its native timbers. At the present time it ranks far down the schedule of timber wealth. This statement is proved by the fact that while America's percentage of forest area to the whole is twenty-five, despite the close settlement of the country and its great population, Australia, with its vast unsettled spaces, has a percentage of only four—certainly an astonishing situation. The fact is, that the far greater part of our forests has been largely restricted to the coastline of our island continent and there human settlement has been almost wholly confined, so that great forests have given way to open cultivated lands within the rain belt. What we have lost in timber wealth is incalculable, and we are not doing enough to replace the terrible and continuous wastage.

From the first years of settlement, little more than a century and a half ago, our people have not realised their wonderful heritage, and thus much valuable timber has been destroyed. In addition to its timber value, the forest absorbs and conserves moisture and gives it out again in springs. On the other hand, the permanently cleared land is liable to a disastrous dryness and infertility which cannot be repaired by any means, thus defeating the ends of clearing for agricultural cultivation and human settlement. Only judicious "clearing," as distinct from extermination, should be practised even at this late time. Repeated clearings will wipe out the forests permanently and do great harm to the water supply of its neighbourhood. More trees should be grown in country places, especially on farms, to provide shelter, shade and timber. Yet in our sunny Australian climate, treeless farms are in the majority.

Tree-life or forest-cover helps to maintain the fertility of the land in regulating stream flow and in preventing undue erosion of the land surface by rain and wind, in reducing evaporation, in rendering climate more equable, in helping to maintain a public water supply, and in providing break-winds for large areas. The maintenance of forest-cover on certain areas is essential for the prosperity of farm lands. A further advantage is that, in affording shelter to birds, trees help to preserve the balance of nature, by providing natural means of keeping down the insect pests which are great enemies to cultivation; though it is well known that some birds make a great levy on cereals and fruit, yet they give a generous return in the destruction of insects. Birds also feed on the tree insects which perforate bark or leaves, and on the fungus that would rot the roots.



Robt. Scott, Adelaide, photo.

Park Lands at Mount Crawford, S.A.

A great public need at the present time, before it is too late, is the fostering of a forest spirit, and this is being undertaken to some extent by the Australian Forest League and a few minor Societies, the Governmental Schools of Forestry, and the encouragement of tree-planting by Municipalities, and to a small extent in school grounds through the agency of Education Departments. The Governments have their own Forests Commissions for the conservation and cultivation of valuable timber trees, and afforestation is proceeding steadily and with hopefulness for the future.

Out of the total area of the Commonwealth, comprising some seven hundred thousand square miles, twenty-four and a half million acres of land have been permanently allotted for this purpose as follows: In the Federal Capital Territory 96,500 acres; in New South Wales, 8,000,000 acres; in Victoria, 5,650,000 acres; in Queensland, 5,218,000 acres; in South Australia, 500,000 acres; in Western Australia, 3,000,000 acres; and in Tasmania, 1,500,000 acres. Already over nineteen million acres have been reserved by the various forestry departments, and planting of hardwoods and softwoods is proceeding—the latter to supply the requirements that have to be wholly

imported, for the native trees of Australia are almost entirely hardwoods. Thus we see what has been, and is being done in a great public work, the value of which will be more fully recognised by future generations.

But much more should be done, and the general public, and especially the settlers on the land, should assist. Tree cultivation must be encouraged in every possible way. Though the trees of a country grow naturally and in abundance in a climate and on a soil for which they are suited by nature, many will respond to the care of skilful hands which cultivate them with understanding, even in places that are far from their native habitat. As far as possible the hardwood timber needs of the community should be met from local sources or from countries within the Commonwealth, and a primary need is satisfactory knowledge of the woods.

Many Australian trees, exclusive of the great Eucalypts, grow to a size that is at least exceptional among the trees of the world. This is remarkable when we consider the relative dryness of our climate during a large portion of the year, and the small portions contained in our soils of two very important nutritive elements, essential to plant life, namely potash and phosphoric acid; also the surface soil is, on the average, shallow, so that trees in this country have to be very hardy to survive in some localities, especially those of a rocky nature. Yet they thrive and often luxuriantly, thus proving their natural hardiness, for it is the survival of the fittest with Australian trees, as is shown by their fine height and size in many places where tenderer plant life could not survive. Their bark and seeds are consequently dry and hard, and the foliage is in almost all species evergreen. The seeds, owing to their usually hard shells and interior dryness, have wonderful tenacity of life, and are one of the marvels of plant life. Many of the seeds require much heat to germinate them and will sometimes remain fertile for thirty years or more. This has been demonstrated by the growth of trees from seeds, the age of which was known, and by the astonishing way that forests have sprung up, following grass fires on country which has had no trees for generations.

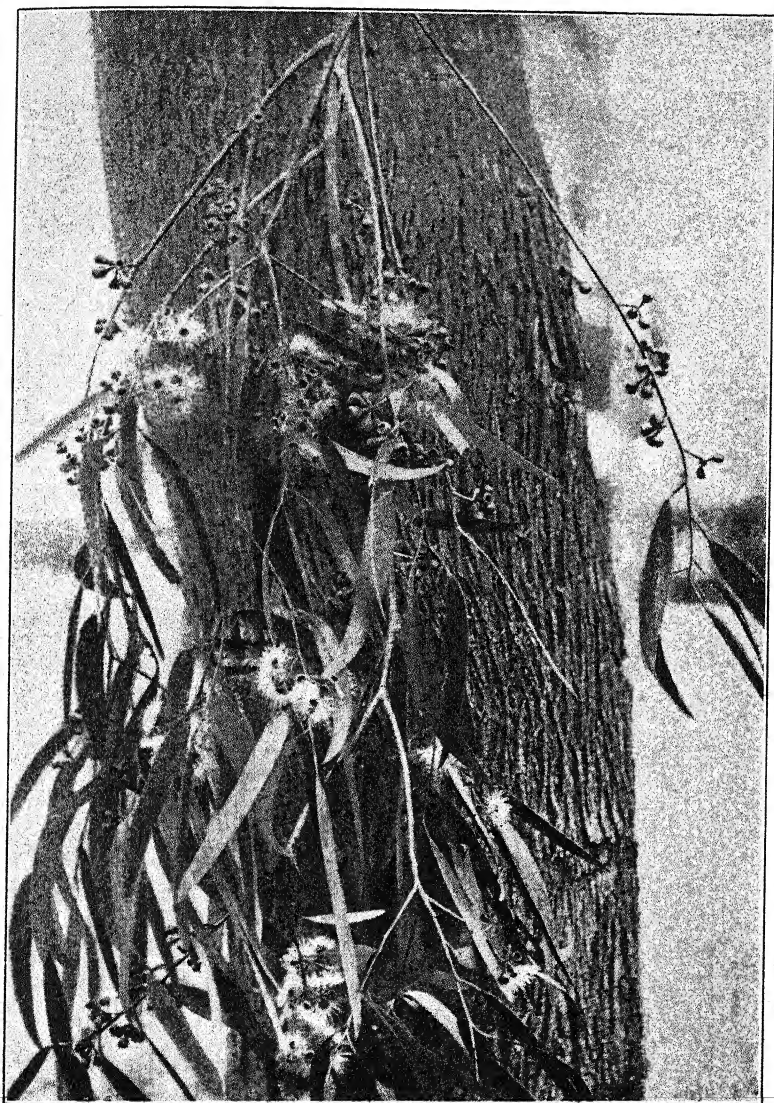


Fruit of *Eucalyptus longifolia*

THE AUSTRALIAN FOREST

IT has been said by people who are not very observant that Australian trees are monotonous in colour, dark, gloomy, and dry-looking, chiefly on account of their hard evergreen leaves. But actually, they do shed their leaves in the winter and abundantly, yet always retain a large proportion of their foliage. They grow a multitude of new leaves every Spring, and these are often brilliant in their variety of colours, according to the nature of the tree on which they grow. The tender green, the bright gold, the copper or the glowing red of the young leaves and their rich russet hues in Autumn, are quite unique in tree foliage! A far larger number of our trees, too, than those of other countries bear blossoms of bright colours—the yellow, white, red and even green flowers of the Eucalyptus trees, those Kings of the Bush, and the silver or gold profusion of the Acacias, its true Queens; the red or white or orange of the bottle-brushes, the cadmium-orange of the Silky Oak, the purple of the Mint Bush, to name but a few of the most familiar. While the grandeur, the impressiveness of the Australian forest rests with the tall timber, there is much beauty in the undergrowth of shrubs and small plants, not only in their flowers but their leaves, in the season when it rejoices in glorious colours and sweet scents. The Bush always has a fragrance peculiar to itself, generally pungent and musk-like, more distinct even than the "piny" savour of English woods. In Australia we are so used to size that trees of less than 30 feet in height are regarded as little more than scrub, though they are recognised as an essential part of the forest. They cannot be disregarded in realising a true picture of the sylvan scene; indeed, many shrubs belong to the same genus as some of our large trees. Probably, nowhere in the world is there more variety in plant life than in this so-called monotonous and dreary region of the world to which the euphonious name of Australia was given. In addition to the fallacy that our trees are gloomy and even grotesque in appearance, there is another, held even by Australians, that we have very few kinds of trees. When we ask for facts in support of such a statement, we are told that there are only gums and wattles, and a few others such as tea-trees and honeysuckles. Gum trees are to them as few in species as wattles, though actually there are probably more species of either than of any other trees of the world, for there are about four hundred species of the one and about eight hundred species of the other, also considerably more than three hundred species of trees not related to either.

But before dealing with the many genera of Australian trees including a vast number that are scarcely known at all, even by name, to the average citizen, let us consider their nomen-

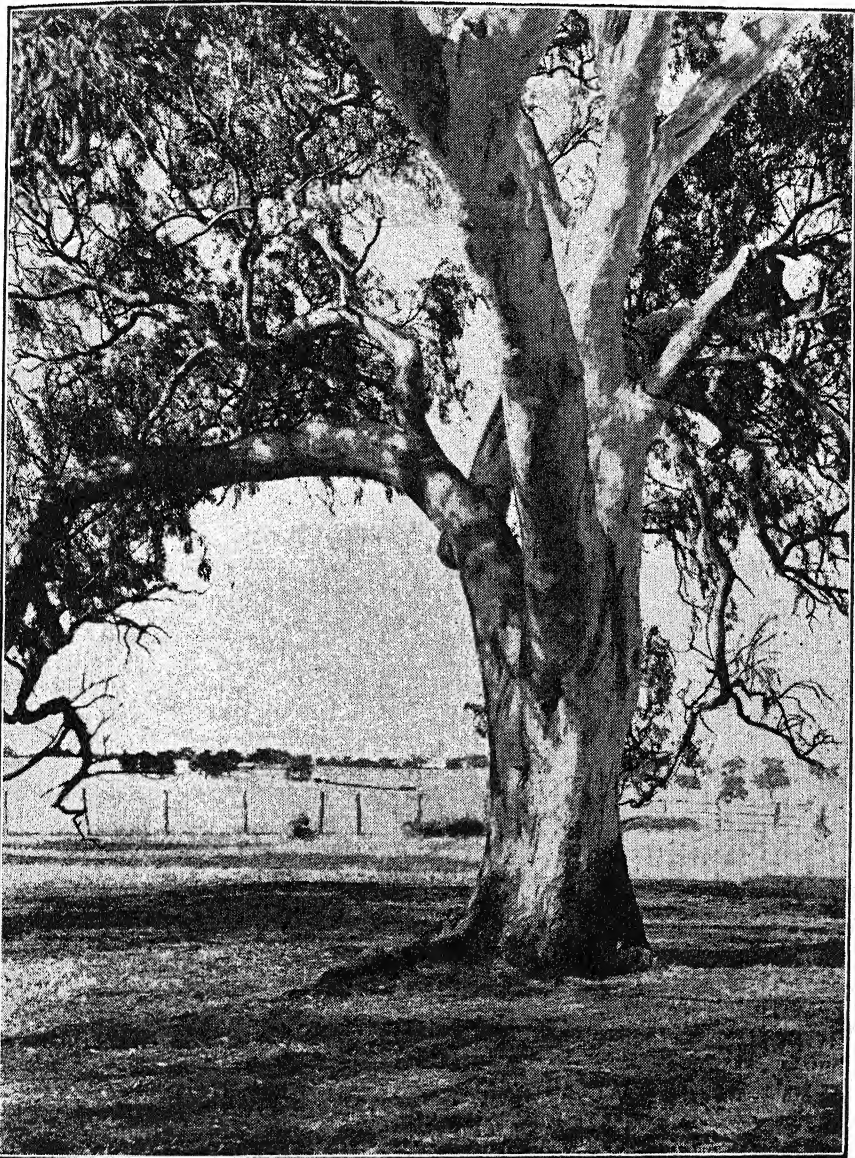


U.S.A. Bureau of Forestry, photo.

Flowers, Fruit, Leaves, and Bark of
Eucalyptus melliodora (Yellow Box)

(See page 50)

clature so that we may know to some extent (for this nomenclature has never been finalised) the nature of each tree from its scientific rather than its popular name, the bestowal of popular names having been very haphazard and irresponsible and therefore necessarily confusing. The scientific names are derived from Greek or Latin words so that they may be understood by scientists of different nationalities. In some cases, as will be seen, the application is rather vague, but it has been found sufficient for purposes of identification. The application of popular names is, however, in many and perhaps most cases very indefinite and often inaccurate. Gum trees, for instance, have very little gum, and not a very great number even supply the oil we know so well; but nearly all are wonderful for their timber. Acacias are named "wattle" for a somewhat indefinite reason, connected apparently with the process of wattling or making a kind of wickerwood; the native cherry, apple, plum, or pear are not edible fruits; the She-oak and Bull-oak have nothing to do with the true Oaks; and there are hosts of nicknames of questionable origin and little meaning. The popular descriptive names generally have at least some appropriateness, though used rather confusedly in some cases locally and for more than one species, among these being Mountain Ash, Blue Gum, Beefwood, Satinwood, Mahogany, Silky Oak, Box, etc. Then there are the more or less melodious-sounding names bestowed on them by the aborigines—Boree, Mulga, Gidgee, Brigalow, Jarrah, Karri, Mallee, Coolibah, Banyalla, Wilga, Kindel-kindel, Wandoo, and scores of others. With the Latin specific names, tacked on to a usually Greek generic name, we are on surer ground, for they are strictly descriptive, as for instance the terminals "phylla" and "folia" meaning leafed, so that "monophylla" means one-leafed and "longifolia" long-leafed; "linearis" is narrow-leaved or "lineata" or "linum" line-leafed; "leprosa" is scurfy or mealy; "rubida" means red-stemmed, and "rostrata" red; "xylon" is wood, so "leucoxylon" is whitewood and "melanoxylon" blackwood. The blackwoods, however, are not really black but dark in their timber, and the lightwoods are so called because of their light weight, and not their colour.



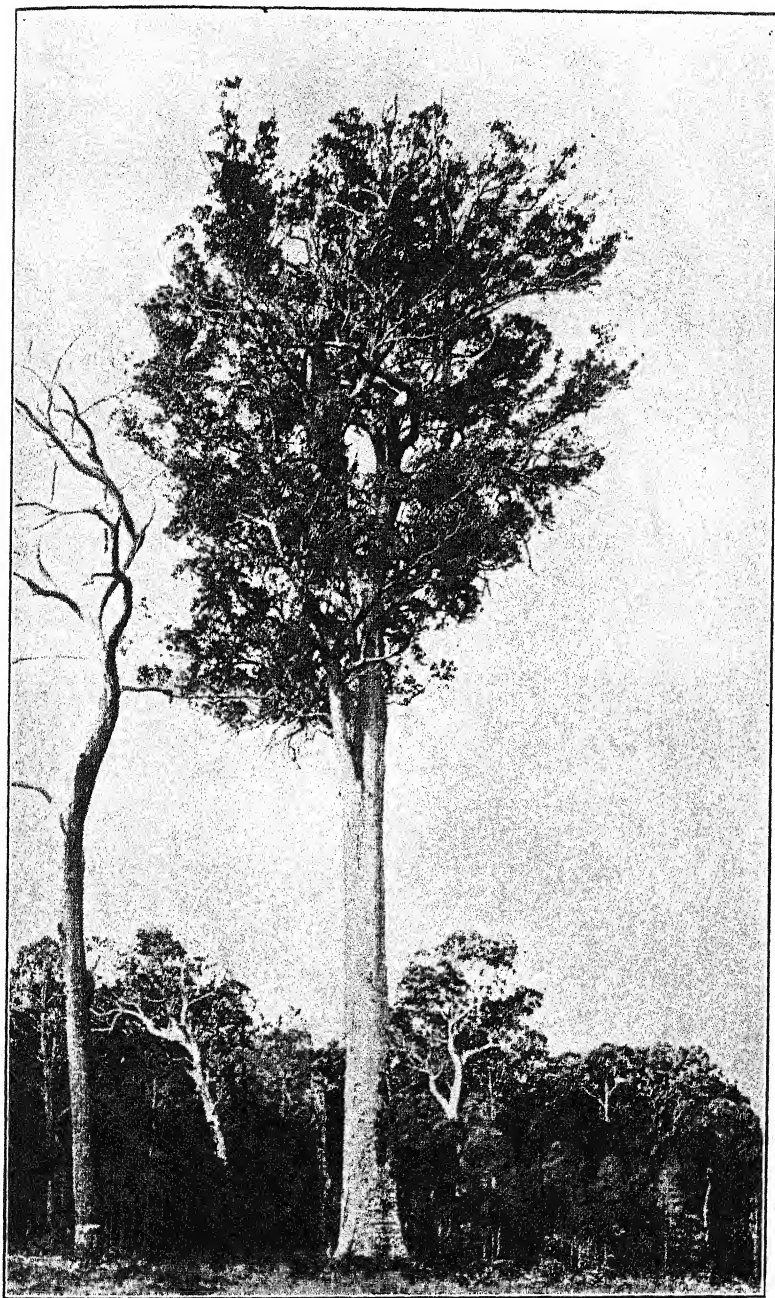
Forests Department, Melbourne, photo.

Eucalyptus rostrata (Red Gum)

THE PRINCIPAL TREES OF AUSTRALIA

THE principal trees of Australia are divided broadly into five main families comprising 165 genera and many species. The most numerous are the Legumes (*Leguminosae*) which are headed by the genus *Acacia*; the Myrtles (*Myrtaceae*), the chief being the Eucalypts and including *Melaleuca*, *Leptospermum*, *Callistemon*, *Eugenia*; the Proteas (*Proteaceae*) including *Grevillea*, *Banksia*, *Stenocarpus*, *Hakea*; the Conifers (*Coniferae*) comprising *Callitris*, *Araucaria*, *Podocarpus*; and the Figs (*Moraceae*) including *Ficus*, etc. Other important genera are *Sterculia*, *Pittosporum* and *Casuarina*. Regarding the localities in which different genera or species grow naturally, some are found more or less over the whole Continent, and sometimes also in Tasmania; others have a very restricted area, though specimens may be planted successfully, thriving under cultivation, in other parts of Australia, sometimes where the climate is different; others grow mostly in forests more or less confined to their own genus; and others frequent forests containing trees of many species. It must be remembered also, when we find that many of the trees that grow on the mainland, are also found growing naturally in Tasmania, that Bass Strait did not always divide that Island from the Australian Continent. It will be found that certain trees grow only in the northern tropical or central parts. Others are confined to the forests in the north of New South Wales and south of Queensland, and others grow naturally only in Western Australia, principally in the South-West. It is interesting to note these distinct distributions, which are often very marked.

The hardwood timbers of Australia comprise the far greater portion of its forests, and are highly esteemed by all who use timber. Many of the first ships to come from Great Britain made their return journeys laden with timber freights, as builders on the other side of the globe soon learned that Australian hardwoods were very durable, handsome in appearance, and more suitable for certain purposes, such as those requiring hardness, toughness, strength and weight, than a large number of woods in use there. Thus Australia, before it began to export metals, wheat, wool, meat, butter, fruit and wines, started trading in timber with the older countries. Growing in abundance over a considerable extent of this vast Continent, and especially within reach of the coast, were countless millions of the most valuable and some of the biggest trees ever offered to the appreciation of man, yet the first policy of settlement has been their destruction and not their utilisation. Only of recent years has this priceless heritage been fully realised, and now to a great extent it has been already sacrificed. The early



N.S.W. Government Printer, photo.

Eucalyptus marginata ("Jarrah")

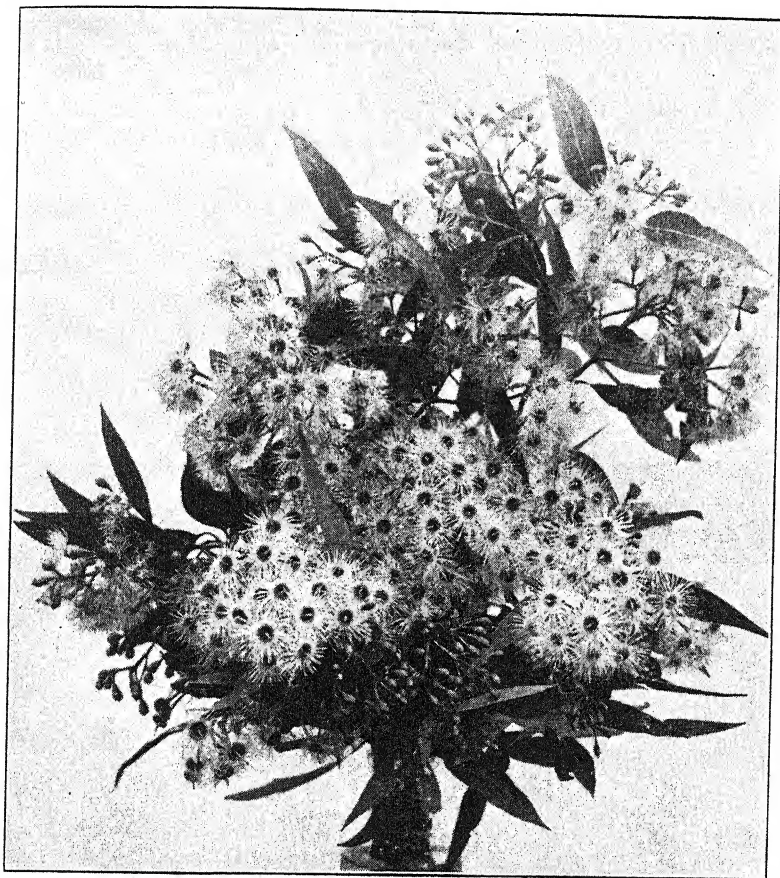
(See page 40)

settlers failed to realise the wealth placed in their hands by bountiful nature, and it was only a few scientific men who realised the value and botanical interest of the Australian forest. The timbers of Australia produce such a diversified texture, grain, colour, weight and other characteristics that suitable woods can be found to supply almost any trade, so that our forests have a high commercial value.

Though the subject is undoubtedly inviting, it would be a lengthy task to describe in full detail even one of our trees, for each has its own general characteristics, and these vary as it grows to maturity, or in accordance with its environment or circumstances. Our trees are, however, alike in one respect, and that is that their foliage, in all but a very few species, is evergreen. An Australian tree is a very interesting and complex object to examine in detail, and those people who say that our trees are monotonous, uninteresting and even ugly, evidently have no real knowledge of them. The flora of Australia is most interesting and remarkable owing to its great difference from that of any other part of the world. The odd features impressed by nature on the Australian landscape, can be at once recognised, except in a few localities. We are surrounded by forms of the vegetable world, which as a complex nowhere occur beyond its territory. It will be instructive, therefore, to state something about what constitutes a tree in this part of the world, though only a very few out of hundreds of details can be given. For instance, Australian trees in many cases, naturally shed their bark. This at first is almost always smooth and not hard, but as the tree matures, it becomes dry and either peels off in its shedding season or becomes fissured or gnarled. Trees that lose their bark renew it gradually, and this bark in time also peels off. The natural shedding of bark is a characteristic feature of many of our trees. Some Eucalypts shed it in long flakes, while in others the bark becomes fissured but remains on the tree as the outer layer of dead bark is expanded by the growth of the trunk. The barks of all trees in the same species are not always uniform; in some Eucalypts the bark is smooth, while in others it is thick and flaky, even to the higher branches.

The young or bud leaves of many Australian trees are protected from the effects of climate by covering scales which fall off as the buds expand into leaf, others by a coating of gum or resin, and others by fine hair or wool. Sometimes the buds are unprotected, in which case they are known as "naked." The young leaves change their form completely as they mature and there may be different shapes of leaves varying considerably on the same tree. Some leaves are single and others grow in a few or many numbers of the same or different sizes, on the same stalk. Their shapes are described as "linear" or flat and narrow; "acicular" or needle-shaped; "subulate" or narrow

and tapering; "lanceolate" or lance-shaped elongate and tapering at both ends; "oblong," "oval," "ovate" or egg-shaped; "spatulate" or broad and round at the apex; "cordate" or heart-shaped; "sagittate" or arrow-shaped, etc. The colours

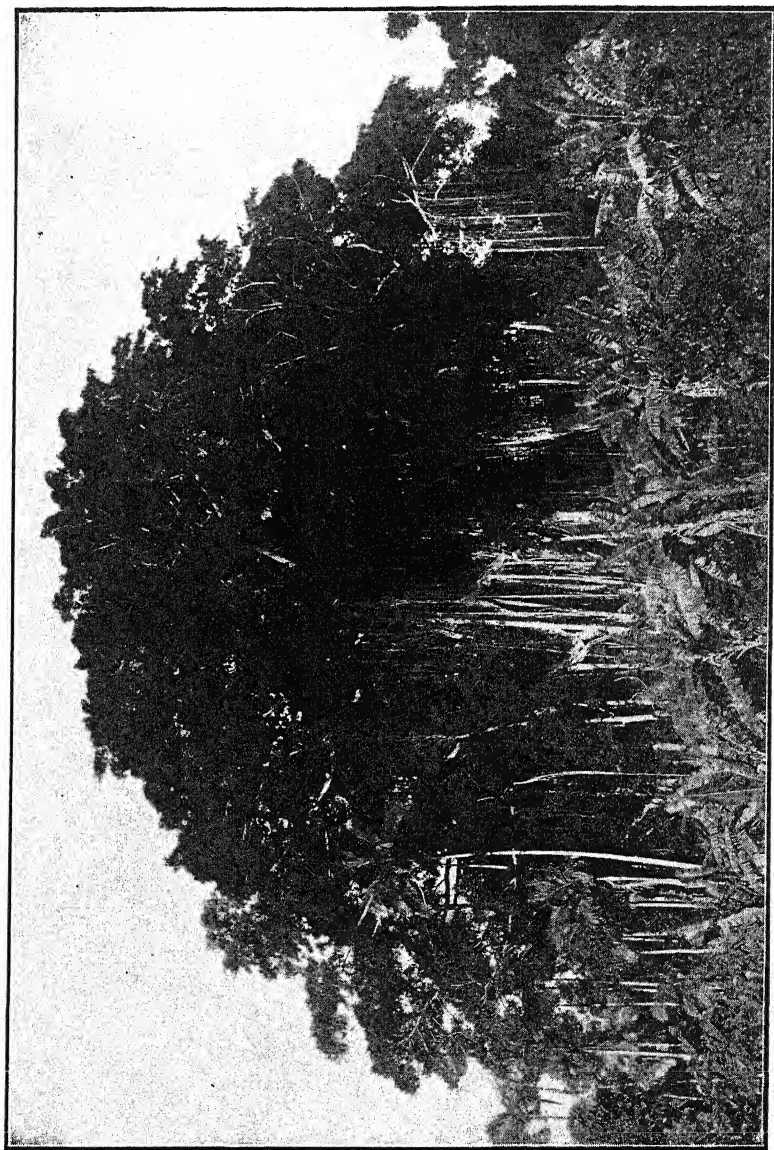


U.S.A. Bureau of Forestry, photo.

Eucalyptus trachyphloia (Bloodwood)

(See page 48)

of the young leaves are usually very bright, red, golden or pale green, varying in different species. In some species the leaves have a very marked odour, caused by the ethereal oil they contain in their oil glands or oil dots which may be seen

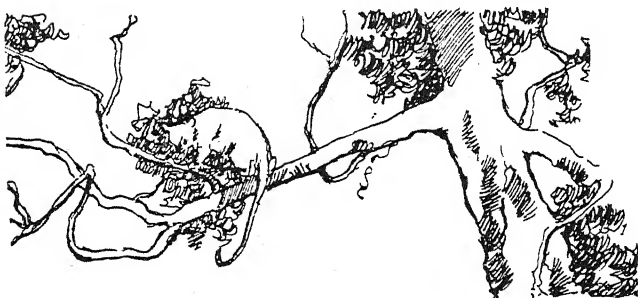


Aerial Roots of the Banyan Tree (*Ficus columnaris*)

by holding up the leaves so that the light strikes through them. The taste of the leaves is sometimes hot, bitter, acid, or like turpentine in some species.

The roots of our trees are also of much interest. Some are seen growing in the air as well as in the ground, but some aerial roots grow from the branches, especially in the case of the Fig-trees (*Ficus*) and these go down and into the ground, and from them in some cases new trees will grow. The mangroves will turn up their roots from the soil like knees for a distance, by that means getting a firm hold in the muddy swamp and deriving nourishment from the air for the long roots. Another kind of aerial roots called adventitious, grow on Eucalypts and tea-trees in swampy ground. These roots sometimes attain considerable size, and are beneficial to the tree by inhaling air when its main roots are covered by water; but these are by no means common. Regarding the depth attained by the roots of our trees, various estimates have been made ranging from 20 to 40 feet, and much more in special instances, where the tree roots have had to penetrate considerable depths in search of water. Roots belonging to Karri trees about a hundred feet high have been found hanging from the roof of a cave sixty feet below the surface, and even extending several feet into the floor of the cave. It is held that roots of the Marri (*E. calophylla*) for instance are capable of descending to 150 feet. Generally speaking the trunks of trees are round and straight, especially when growing close together in the forests, but in the scrub forests of the Northern coastal districts of New South Wales and Queensland, as well as in other States, the buttress stems occur. They are often of considerable size, nearly vertical and quite thin. Sometimes these buttresses extend in fantastic shapes along the ground and form natural struts to the trees in areas of well-watered, good soil and warm temperature, where competition amongst tree individuals is very keen. These buttress stems or roots are sometimes remarkable; in the case of the Moreton Bay Fig Tree (*Ficus macrophylla*); it has been said that twenty men could easily hide themselves completely behind its buttresses.

The great variety in size, shape and colour of the flowers of Australian trees, many of which are brilliant in colour and remarkable in form, and the diverse character of their seed vessels and seeds, are subjects too complicated for general description. These are referred to in describing the various species. The odour of the bark and wood is of interest as probably every timber has its own characteristic odour, and some are especially distinctive, as for instance, Sandalwood, Onionwood, Musk, Raspberry Jam, Dogwood; there are plenty of Rosewoods, some with rose-coloured wood, and others with rose perfume. The Conifers or Pines have their individual scents, and among the Acacia timbers some are aromatic.



THE FOREST AND AGRICULTURE

*"It is a goodly sight to see
What heaven has done for this delicious land;
What flowers of fragrance blush on every tree,
What glad'ning prospect o'er the hills expand!
But man would mar them with an impious hand!"*

—Byron.

IN the early days of settlement the farmer set himself the task of "clearing" a farm out of the dense scrub with mammoth trees growing among it. He was concerned only with the land in which they grew. The trees were in his way and robbing the soil of nutriment, and also a danger from fire, and they were destroyed. He did not value the forest timber, but regarded it as a hindrance to the immediate task of tilling the soil. Many valuable and beautiful timbers have been burnt as rubbish during clearing operations. It is desirable that every settler should know enough about forestry to be able to discriminate between useful and worthless trees, so that he may cut out the rubbish first, and leave the sound timber standing at least until its value can be determined. Also the relation of our forests to climate and erosion must not be overlooked, and the effect of forests in water economy. To have its most beneficial effect in stream regulation the forest catchment should not be grazed, fired or otherwise disturbed in its normal function.

Most frequent runs are overstocked, and natural regeneration of timber is prevented by the ravages of the animals, consequently the wooded ranges are losing their protective cover and are rapidly becoming bare rock ridges. The soil swept



Forestry Commission, photo.

A typical Eucalypt forest of the wet, cool mountain zone

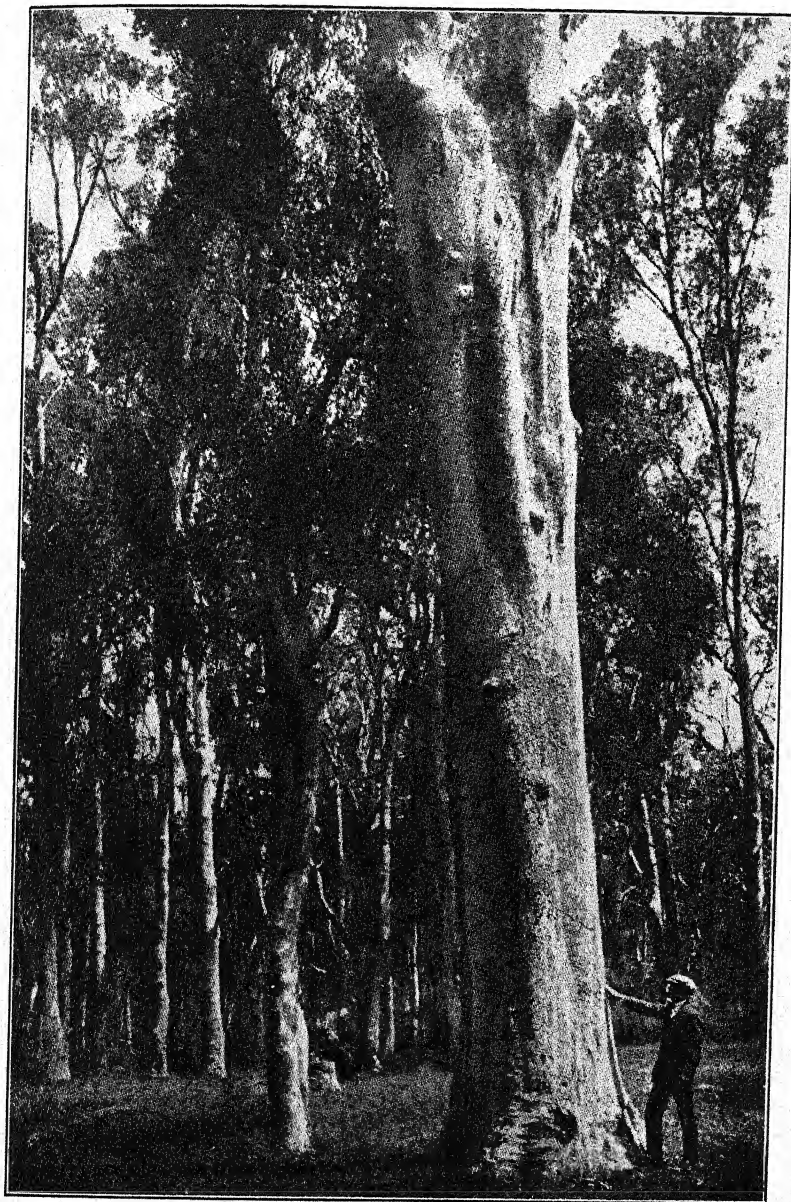
down by the accelerated run-off into the drainage channels is deposited as sand and gravel in the fertile valleys. Erosion is becoming very active as the inevitable result of deforestation. Deep, well-defined streams are becoming broad and badly marked water courses, an effect due to diminished bank protection and accelerated velocity of streams in flood periods.

A full recognition of the great value of forest areas is needed, and as soon as a tree is cut down, another should be planted in its place. This is done in many European countries and quite extensively in Japan, where whole mountain sides are densely covered with coniferous trees. The trees are planted very close together to make them reach for the sun, and in this way splendid straight logs are obtained. On the matter of erosion due to timber destruction we have some appalling conditions. In some places in Gippsland, river banks have been so eroded that they are eight or nine times their original width, the mouths are gradually being filled with sand brought down from the highlands, and parts which were once navigable are not now deep enough for motor boats. Even at this late day steps should be taken to prevent further disastrous results. No clearing of timber on reserved river or creek frontages should be allowed. The banks of rivers should also be planted with soil-binding trees.

The dangers of the destruction of natural wind-breaks is being exemplified at the present time in the Mallee country, where the fertile wheat lands are in danger of being converted into a desert by the gradual encroachment of shifting sand, through the action of unimpeded storms. As a Mallee farmer wrote: "Few persons who have lived in the Mallee for any length of time have not seen that awe-inspiring spectacle of a ponderously-moving cloud of earth, appearing to have the shape and consistency of a mountain moving across the land under the influence of an eccentric wind. Fears of harbouring rabbits have resulted in the destruction of trees that would make a natural wind break. These apparently were not thought necessary, and, as a result, it is now possible to make a trip of forty or fifty miles in many directions in the Mallee and to count the number of trees standing, without much strain on the mathematical ability."

*"More bleak to view the hills at length recede,
And less luxuriant, smoother vales extend;
Immense horizon bounded plains succeed—
Far as the eye discerns, without an end."*

—Byron.



Australian Forestry Journal, photo.

Eucalyptus gomphocephala ("Tuart") Forest

(See page 50)

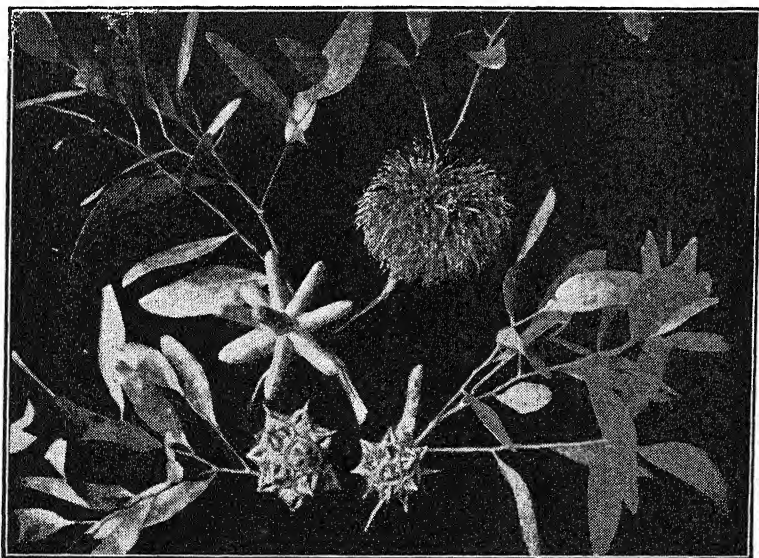
AUSTRALIAN FOREST PESTS

LIKE everything else in the floral world, trees are subject to pests, diseases, and insects, and the science of combating them is being highly developed. Methods of dealing with them or their ravages are mostly confined to the treatment of the affected timber after it is felled and being prepared for use—rather late in the day in most cases. Australian trees are more open to attack by insects than those of other parts of the world because they have no efficient feathered allies, such as the woodpeckers of Europe and America, who wage constant warfare upon all wood-boring beetles, moths, and their larvae. The only birds that can pick out the wood-grubs are the black cockatoos which frequent the forest lands and provided with a very powerful beak capable of tearing off quite large pieces of the gum trees when searching for wood-grubs. There are a number of ground-hunting birds in the scrubs that feed upon insects and land snails, which otherwise might become a serious menace to the foliage and stems of the forest trees. Where Eucalypts, Acacias, and other hardy trees are grown in cultivation they are more liable to insect pests than where growing under natural conditions.

Forest insects injure trees in many different ways: some eat the foliage, others suck up the sap from the leaves, others web leaves together with silken strands. All foliage is destroyed, chiefly by the caterpillars of moths and butterflies, or sucking insects, the most dangerous being the scale insects. There are the timber-boring insects, the worst of all the forest pests, for they penetrate into the heartwood of some trees. These are popularly known as "borers" and include the well-known termites or white ants. The milk-white ant (*Termes lacteus*, now known as *Coptotermes lacteus*) is the common species in Australia responsible for nearly all the damage done to the timber of houses, but one or two species of the allied *Entermes* frequently infest fence-posts or outside woodwork. The one species of wood-boring beetle native to Australia is the powder post beetle, the scientific name of which is *Lyctus brunneus*; it is exceedingly minute, only 3-16ths of an inch long, and varying in colour from reddish-brown to black. Unfortunately it has no parasite to destroy or check it. It infests the sapwood of our Eucalypts. Of the shot-hole borers the genus *Platypus* is a typical example and there are several species in Australia, the common one, *P. omnivorus* infesting Beech, Blackwood, Corkwood, Sassafras and Coachwood, very active in Summer but not noticeable in Winter, and boring into the heartwood when it is sappy but not when dry. It is a typical, cylindrical borer and of a general, dark reddish-brown colour. Fortunately,

some of our trees are borer-proof and white-ant resistant, for various reasons, the chief being the strong odour of the wood. Among these timbers are some species of *Eucalyptus*, *Sterculia*, *Elaeocarpus*, *Cedrela*, *Dysoxylon*, *Flindersia*, *Melaleuca*, *Syncarpia*, *Doryphora*, *Grevillea*, *Casuarina*, *Callitris* and *Podocarpus*, which are ant-resistant. Softwood is most liable to borers and the only way to defeat them is to impregnate the timber before use.

There are also plant galls among the diseases of the trees, these being woody excrescences on some part of a tree affected by insects or fungus, and they range from a very small size to that of one's closed fist. Most of these are constructed by insects as shelters for their eggs and larvae, and from which the young insects emerge to begin their depredations on leaf, bark and wood. There are also the fleshy rust-galls which are of fungus origin. Sometimes the whole of the foliage and twigs of a *Eucalypt* tree are covered with galls; *Casuarina*, *Melaleuca*, and *Leptospermum* are also affected. Some cover the surface of the *Eucalypt* leaves with multitudes of tiny, bright red blisters each containing an insect. Australian gall-making scale insects produce remarkable galls of a most complicated structure.



E. E. Pescott, photo.

Bud, Blossom, Fruit and Leaves of *Eucalyptus Lehmanni*
(Green-flowering Gum)

(See page 40)

EUCALYPTUS TREES

TO THE BLUE GUM

Behold the tree, upon a mountain's breast

*A stem gleams whitely, veiled with gray and blue
And crowned with green; the sunbeams love to rest*

*Among the leaves, and thread the branches through
With gold, where pale as stars on clustered foam*

*The blossom smiles through leaves blown by the wind
To laughter. Naiads in their azure home*

*Might envy her the grace of limbs that find
A chariot in the wind. The sunset flame*

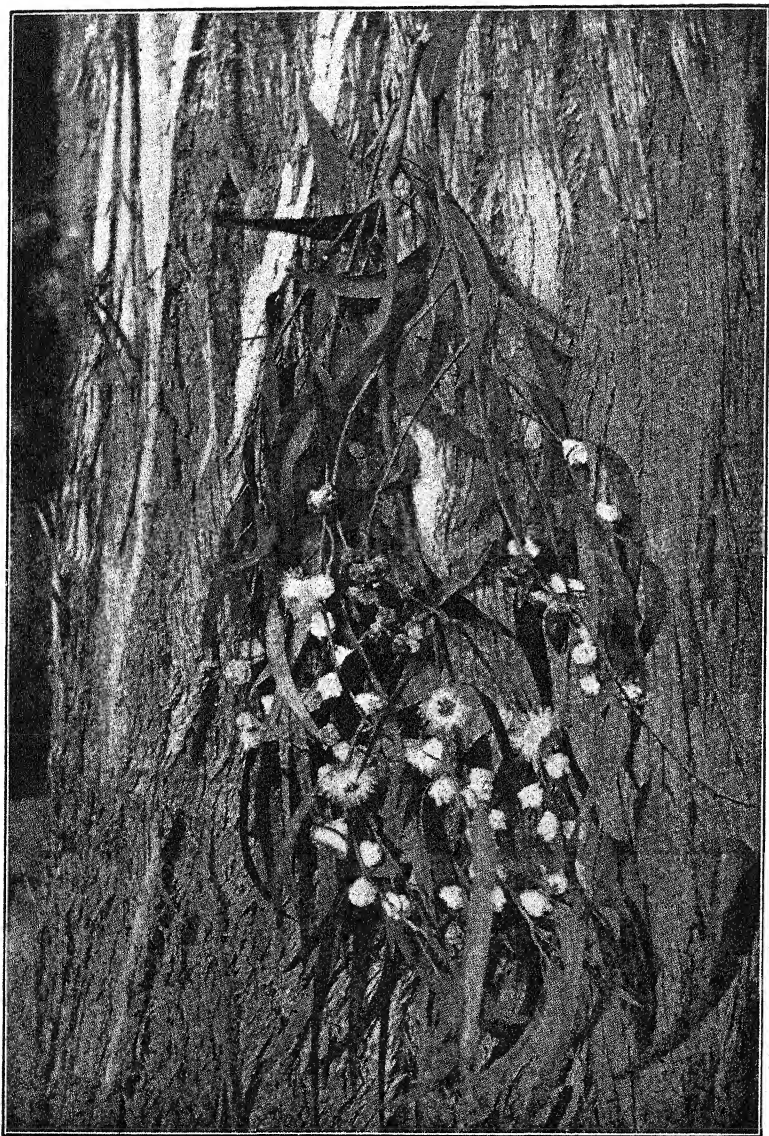
*That burnishes young leaves sees in their glow
A kindred brightness, for the light that came*

*At dawn is prisoned in those crests that throw
Beams through the azure of the sunset air,*

*And bid the rapture linger in their heart
After the heaven itself is pale, and spare*

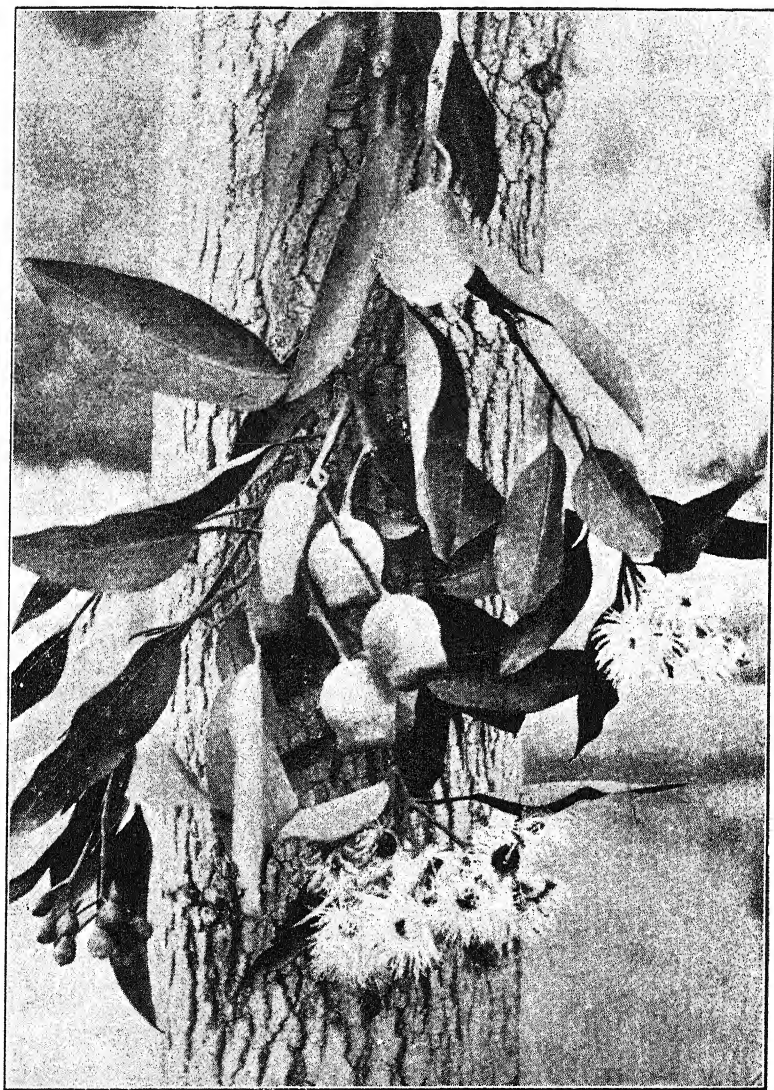
Bright kisses for them from the lips of night.

(The Eucalyptus trees, or Gum trees as they are popularly called, may be ranked chief among Australian trees, for most of the reasons that count in the consideration of trees. First, for the fact that they are unique and truly native to Australia, then for their size, age, and the grandeur of their form, the exceptional hardness and other fine qualities of their timber, and their many economic values. The term Eucalyptus is derived from the Greek words *eu*, "well," and *kalyptos*, "covered," in reference to the covering of the flower buds by a lid or operculum, which is thrown off when the bud bursts into bloom.) The term, Eucalypt, is used to embrace a great genus of about 400 species, varying under the different conditions in which they live and sometimes difficult to differentiate; some are probably only casual hybrids. The Eucalypts have a wide popular nomenclature, and have been given various names, more or less descriptive but not always very exact, such as "Peppermint," "Mahogany," "Ironbark," "Stringy-bark," "Messmate," "Box," "Oak," "Spearwood," "Tallowwood," "Bloodwood," "Ash," "Woollybutt," "Blackbutt," "Leather Jacket," "White" "Red" and "Blue Gum," and so on, usually on account of their timber but sometimes on account of their bark. These names are applied without scientific system or exactitude, and cause confusion among foresters, timber users and the general public alike. For instance, there are six species called Blue Gum; in Victoria the name is applied to *Eucalyptus globulus*, and in New South Wales to *Euc. saligna*; Messmate in Victoria is termed Stringy-bark in Tasmania. The principle



U.S.A. Bureau of Forestry, photo.

Flowers, Fruit, Leaves, and Bark of
Eucalyptus globulus (Blue Gum)



Australian Forestry Journal, photo.

Buds, Flowers, Fruit and Bark of
Eucalyptus calophylla ("Marri")

(See page 46)

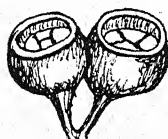
fibre is obtained, which is marketable when teased and dried. It has been made into mats, sacks, shoes, hats, ropes and cords, camp-stools and chair-backs, and a substitute for jute in the making of corn-sacks. It is also used in the extraction of tannic acid for the preservation of leather, and in the supply



Euc. occidentalis

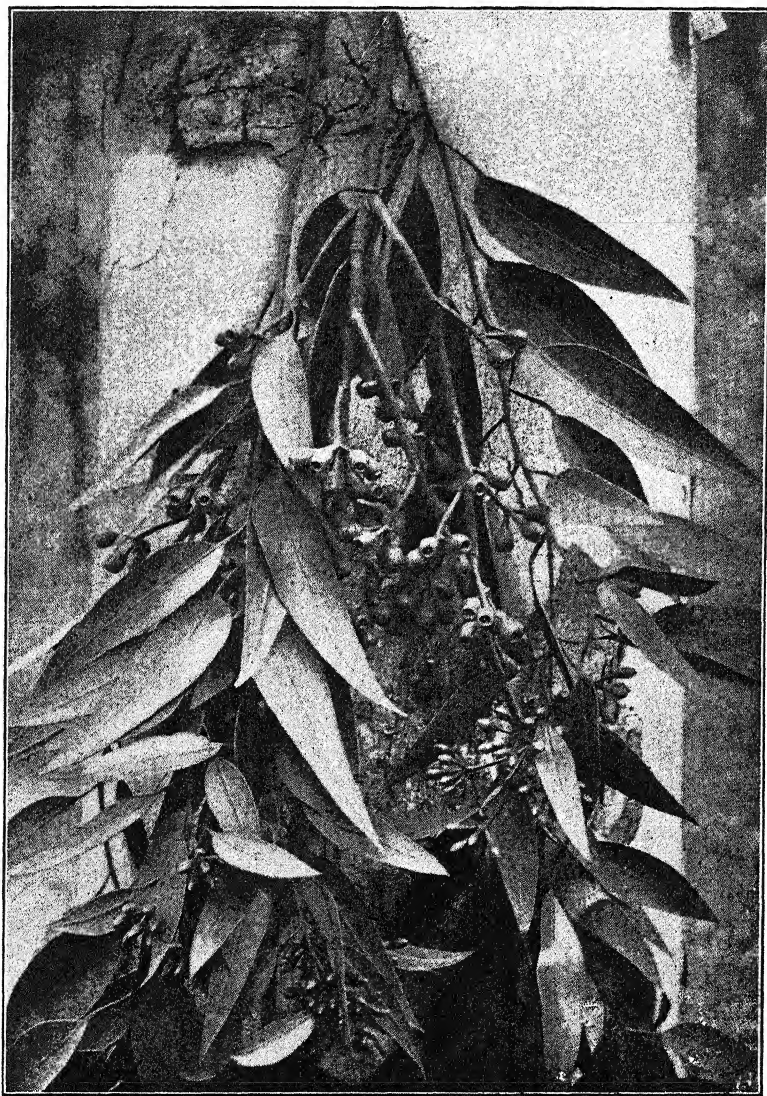
of kino for the same purpose. Swamp Yate (*Euc. occidentalis*) returns 40 to 56 per cent. tannic acid; *Euc. falcata* 32 per cent.; Mountain-gum (*Euc. albens*) 30 to 32 per cent.; White-Mallee (*Euc. erythronema*) 30 per cent., and there are others of less strength. Eucalypts do not exude true gum, but a kind of resin or kino which is very astringent and useful as a medicinal drug and for tanning and dyeing. The kino of some trees is soluble in water, but of others in alcohol, etc. The Western Australian Marri (*Euc. calophylla*) is considered to have a tannin content of from 50 to 60 per cent., but it stains the leather a red colour. The kino can be scraped from the tree without stripping the bark, so the tree is not killed. That of some other gum trees usually reddish in colour, is also used for tanning, and that of the Tasmanian Cider-gum (*Euc. Gunnii*) is used, diluted, for stopping bleeding, or in cases of relaxed throat or diarrhoea, and as an indelible red paint or stain.)

Eucalyptus oil is distilled by boiling from the leaves of some, but not all Eucalyptus trees to the extent of 12 oz. from 100 lb. of the leaves, grouped under three classes, medicinal, industrial and perfumery. Medicinal oil for the destruction of germs, as a dressing for wounds, a general tonic, a liniment for rheumatism, and an inhalant for colds and bronchitis. Used commercially for purposes of ore-flotation, and boot polishes, it is also claimed that it can be used as a fuel for driving motor-cars in any internal combustion engine which is operated on petrol but which has sufficient means of vaporisation. About 180 species have been examined for essential oils but less than twenty have yielded oils of commercial value and only ten species are generally used for that purpose.) These are given as Blue Mallee (*Euc. polybractea*), Common Peppermint (*Euc. australiana*), Narrow-leaved Peppermint (*Euc. phellandra*), Broad-leaved Peppermint (*Euc. dives*), Paddy's River Box (*Euc.*



Euc. Sideroxylon

Macarthurii), Lemon-scented Gum (*Euc. citriodora*), Narrow-leaved Mallee (*Euc. dumosa*), Long-leaf Box (*Euc. elaeophora*), Ironbark (*Euc. Sideroxylon*), and River White Gum (*Euc. radiata*) growing in Victoria and some of the other States. For medicinal purposes the first two are most used, yielding 70 and 80 per cent. respectively, the common Peppermint being the best, as its scent is not objectionably



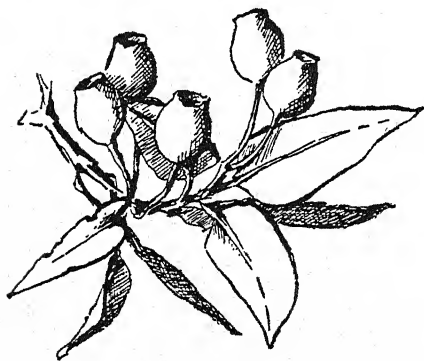
U.S.A. Bureau of Forestry, photo.

Buds, Fruit and Leaves of
Eucalyptus diversicolor ("Karri")

(See page 40)

pungent but is more like lemon; *Euc. elaeophora* and *Euc. Sideroxylon* cause roughing unless carefully rectified. For industrial oils *Euc. phellandra*, *Euc. dives*, and *Euc. radiata*, and for perfumery *Euc. citriodora* and *Euc. Macarthurii*. *Euc. phellandra* and *Euc. australiana* are so much alike as to be differentiated with difficulty. (It is interesting to note that Eucalyptus oil was first exported from Australia as early as 1798, ten years after the coming of the First Fleet to Sydney Cove. Eucalypt leaves are not used to any great extent for feeding stock, but the rapidly growing Sugar Gums have sweet tasting leaves which are eaten readily by cattle, as are the thick leaves of the Drooping or White Sallee (*Eucalyptus coriacea*). Native Bears (Koalas), possums and other native animals live almost entirely on the leaves of certain species of Eucalypt trees, preferring those that are young, tender and sweet.)

In most species the blossoms of the Eucalyptus trees are not conspicuous, being small and sparse, and least in the largest trees, though some species produce abundant and comparatively large blooms of great beauty. The flower is usually a small tuft of fluffy stamens bursting from a cup-like base. In colour these are white, cream, yellow, orange, green, pink, scarlet or crimson.

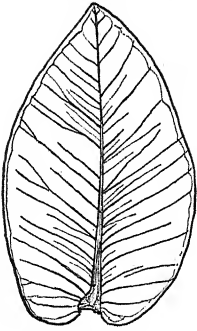


Euc. ficifolia

The red blossoms as in *Euc. ficifolia* grow thickly from slender, terminal branchlets making a blaze of colour over the top of the tree; the leaf stalks are a rich crimson colour and the leaves rich green. The variations in red of the blossoms of different trees of the same species are very marked and cannot definitely be described as pink, red, scarlet or crimson, so subtle are

the shades. This tree is not tall, a height of 30 feet being unusual, but it is frequently wide-spreading. Another red-flowering Eucalypt, also a native of Western Australia, is *Euc. calophylla* which is more upright and grows to 100 feet, and in the ordinary species the flowers are large, handsome and white, but in its variety *rosea*, the colour is light rose-pink. The variety *rubra* of one of the Victorian Ironbarks *Euc. leucoxydon*, has in winter a profusion of pale or deep rose-pink flowers, occasionally deep crimson. The Mount Lindsay Gum (*Euc. erythronema*) is rather a weak grower but has fine deep

red flowers, like the Coolgardie White Gum (*Euc. torquata*),



1 inch
Euc. macrocarpa

another charming tree of smaller size, the seed vessels of which are corrugated. Another red-flowering Gum (*Euc. macrocarpa*) also a western species, is a handsome scrubby tree, with large, thick leaves, covered with a white, waxy bloom, and with large seed vessels. There is also the large flowered Oldea Mallee (*Euc. pyriformis*)—a scrubby tree with either crimson or yellow flowers and light green leaves, and *Euc. miniata* with large clusters of vermilion or orange flowers, and urn-shaped seed vessels. Many Eucalypt blossoms contain honey, and bee-keepers have their favourite species according to district for pride of place as the best

honey tree. The Western district, Victoria, favours River Red Gum (*Euc. rostrata*) and Yellow-Box (*Euc. melliodora*); South Australia prefers Red, White and Blue Gums, but the Coolibah (*Euc. microtheca*) is also considered good. In New South Wales near the Snowy River the White-Top Gum (*Euc. vitrea*) is regarded as the best, and in York district Western Australia, the premier trees are the York (*Euc. foecunda*) and Yate (*Euc. cornuta*). Among other Australian trees of service to the bee-keeper are the tea-trees, *Hakea*, *Callistemon*, and in a lesser degree, chiefly on account of the pollen, the *Acacias*. Individual trees providing honey are *Callicoma serratifolia*, *Tristania conferta*, *Pittosporum undulatum*, and *Grevillea robusta*.

(The Eucalypts are among the foremost of the world's trees for hardwood and decorative timbers—some are among the most beautiful in grain and colour. Furniture manufacturers overseas have recognised these qualities, and increasing quantities are imported by them every year.) Lady Stradbroke (well known as the wife of a former Governor of Victoria) had a ballroom panelled with Australian woods and the effect is reported to be magnificent. Some idea of their value for building purposes may be gathered from the fact that one of the 200-foot Eucalypt trees, the Mountain Ash (*Euc. regnans*), will supply enough timber to build a large country house. As a direct result of their qualities for timber, Eucalypts are planted in enormous areas in the Western States of North America and Africa where the climate is somewhat similar to that of Australia. In South Africa they are used extensively for underground timbering in the mines. It is shown that they are really hardwoods by the comparison of the strength and hardness of their timber with that of such well-known hardwoods as the Oaks of England and *Lignum-vitae* of America.

Eucalyptus paniculata and *Euc. crebra* have a transverse strength of 185 and hardness 7.4; *Euc. obliqua* 150 and 3.8; White Oak is 120 and 3.6; Teak 130 and 3., and *Lignum-vitae* 120 and 6.6. Blue Gum and Messmate are about as hard as English Oak but are stronger; Mountain Ash is as strong but softer and more easily worked, and Gray Box and Ironbark are both harder and stronger than *Lignum-vitae*. All *Eucalyptus* timbers require care in seasoning as they are liable to warp and open when drying.

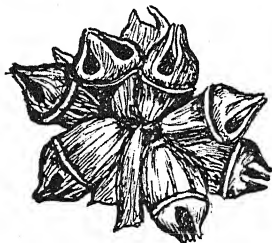
For the weight and strength of *Eucalyptus* timber, we may take the experience of South Australia as typical of Australia generally; well-seasoned twelve-years-old samples show the following weights: Sugar Gum (*Euc. cladocalyx*) 69.3 lb. per cubic foot; Gray Box (*Euc. hemiphloia*) 66.5 lb.; White Ironbark (*Euc. leucoxylon*) 64.5 lb.; Brown Stringy-bark (*Euc. capitellata*) 50.4; Messmate Stringy-bark (*Euc. obliqua*) 56 lb.; River Red Gum (*Euc. rostrata*) 49.5 lb. In a general way the heavier woods are the stronger woods, and with timbers cut from trees of the same species the strengths are nearly proportionate to the densities, though this is not a universal rule. Of those tested, *Euc. hemiphloia* timber was the strongest, 14,400 lb. per square inch when green, and 18,300 lb. when dry, in the modulus of rupture against 10,000 and 14,000 lb. for *Euc. cladocalyx*, the next strongest. The weights given by another authority for timbers when first cut are Ironbark (*Euc. paniculata*) or *Euc. crebra* of East Australia (80 lb. per cubic foot), Yate and Wandoo of Western Australia, 79 lb. first cut and 71 lb. when dry, though Ironbark and Gray Box go down to 64 lb. and 52 lb. Western Australian York Gum air dry weight is 67 lb., and New South Wales Ironbark 64 lb.; Tasmanian and Victorian Blue Gum (*Euc. globulus*) are both 55 lb.; White Mountain Ash (*Euc. regnans*) 41 lb. and Messmate Stringy-bark (*Euc. obliqua*) 42 lb.

It may fairly be claimed that some species of *Eucalyptus* timbers are exceedingly beautiful in grain and colour, and unsurpassed by any in the world. It is hard, considering varying tastes, to make a selection, but certainly among some of the best are Red Mahogany (*Euc. resinifera*), especially the figured timber, Jarrah (*Euc. marginata*), two of the Boxes (*Euc. polyanthemos* and *Euc. Rudderi*), Wandoo (*Euc. redunca*), York Gum (*Euc. foecunda*), Yate (*Euc. cornuta*), Slaty Gum (*Euc. Dawsoni*), Salmon Gum (*Euc. salmonophloia*), River Red Gum (*Euc. rostrata*), Woollybutt (*Euc. longifolia*), Spotted Gum (*Euc. maculata*), Mountain Gray Gum (*Euc. goniocalyx*), Stringy-bark (*Euc. obliqua*), and Brown Stringy-bark (*Euc. capitellata*).

(One of the most important Eucalypts, at least on the eastern side of Australia, is the giant White Mountain Ash (*Euc. regnans*), which grows in Victoria, New South Wales and Tasmania and has attained a reputed height of 300 to 350 feet, one of the tallest trees in the world.) It is commonly known in Victoria as the White Mountain Ash because its wood resembles that of the English Ash; it is much used for house and carriage building, and is one of the freest and easiest working of the pale-coloured Eucalyptus timbers, nicely marked in a straight grain, used for furniture and cabinet work, though less extensively than others of more attractive grain and colour. This timber is used very much in carpentry work, and when it has a straight stem it is easily split into palings for fences, a good worker being recorded as getting 620 five-foot palings in one day from a large tree. It is also used for planks and keels in ship-building as it is light and floats in water. The young wood has been tested successfully for pulping for paper-making. Several measurements of the great height of Eucalyptus trees have been recorded by forest surveyors, and one of the tallest measured—a *Eucalyptus regnans*—attained 362 feet, and another of the same species in Victoria attained 347 feet. A Karri in Western Australia is recorded as attaining a total height from ground to top of foliage of 265 feet (the bole being 135 feet), girth at $4\frac{1}{2}$ feet from ground 33 feet, and at 113 feet above ground, $19\frac{1}{4}$ feet; it gave 62,200 superficial feet of sound timber, weighing about 120 tons exclusive of branches.

(How long the Eucalypts have existed in Australia is not known, but a petrified gum stump was found recently at Melbourne, Victoria, which a well-known palæontologist estimated to be at least 250,000 years old. It is possible the Eucalyptus family lived in another part of the globe, besides Australia, but that was in prehistoric times, if at all. Now it is native to Australia only, with the exception of a few species in Timor and New Guinea, and was not known to present civilisation until this country was discovered. The Eucalypts are sensitive to extreme cold and possibly found the warmer climate of this Continent (which in the past may have been hotter than it is now) the most suited to its constitution.) They have, however, made a home elsewhere, especially in the warmer parts of the world. In the United States one often hears of the Californian Gum, but *wherever the Eucalypts are grown the seed for planting was originally obtained in Australia*. Now they are grown extensively in New Zealand and the Pacific Islands, North and South America, Africa, India, many countries of Europe, and even a few in the milder climate of the South of England. Among Eucalypts recommended for cultivation in the streets, parks and gardens, are the red flowering ones (*Euc. ficifolia*), the Red-Cap Gum (*Euc. erythrocorys*).

a tall, shrubby tree with large, green leaves, and very deep-yellow flowers, the buds being nearly an inch across, and the cap rich scarlet. *Euc. Preissiana*, also shrubby and



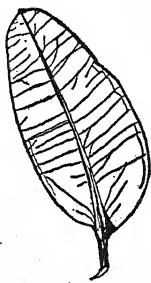
Euc. Lehmanni

yellow-flowered, with broad foliage, *Euc. Lehmanni*, with curious-shaped buds growing close together, and pointing out in different directions; the filaments are forced off when the blossom expands and the result is a cluster of pale green stamens, frequently as large as one's fist (See page 29.)



Euc. Lehmanni

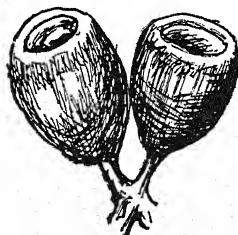
Yate Gum (*Euc. cornuta*) of Western Australia, has similar but much smaller buds and blossoms, the latter being white,



Euc. alpina

but sometimes a rich yellow. *Euc. cosmophylla* has beautiful foliage and conspicuous white flowers. *Euc. alpina* is a white-flowered shrub with glossy leaves; the Spotted Gum (*Euc. maculata*) is shapely and suitable for gardens; *Euc. cinerea*, the Silver Stringy-bark is also shapely and has whitish-brown bark and glaucous foliage; the Manna Gum (*Euc. viminalis*) and the Candle Bark Gum (*Euc. rubida*) are finely white-barked, and the graceful red-flowered *Euc. torquata* is very decorative on lawns.

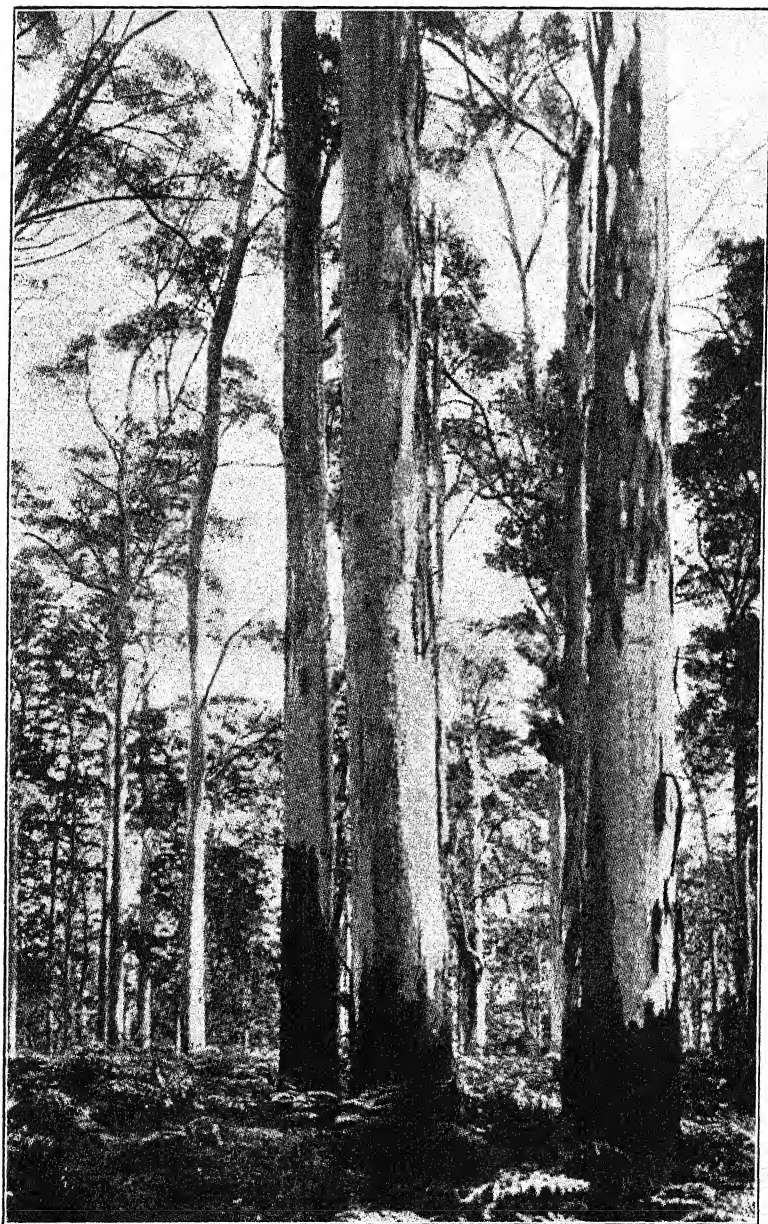
Western Australia is not only famous for its red-flowering Eucalypts which are so largely cultivated on the east and south



Euc. marginata

coastal areas, but for its timber trees, the most notable being those known as Jarrah (*Euc. marginata*) and Karri (*Euc. diversicolor*), the more valuable being the former. It is plentiful in the South-western areas of the State and does not grow to a great height, the average being between 90 to 120 feet. The biggest Jarrah recorded was 8 feet in diameter at the butt and 145 feet total height,

with a 95 feet bole; it was estimated to yield 1900 cubic feet of marketable timber. It is also recorded that one tree provided a log with a mean girth of 21 feet which yielded about 41 loads, while another of 18 feet yielded 24 loads. This timber is perfect for railway sleepers or piles, and for any purpose requiring a timber that will remain for many years uninjured in water, or for flooring, roofing or fencing, as it resists damp, fire and boring insects; for out-door work it only needs oiling and not painting. There is hardly a trade in which this



Australian Forestry Journal, photo.

Eucalyptus diversicolor ("Karri") Forest

handsome timber cannot be effectively used, even for pianoforte cases and carving. It is rich in colour, medium hard and twisted in the grain. The Jarrah only flowers about every five or six years, being very uncertain in its general flowering season and it is very sensitive to frost. The Karri tree is important to forestry, dense-growing, and rivalling the tallest of trees; it has reached a height of a little under 300 feet in numerous cases. One famous specimen known as "King Karri" had a total height of 342 feet, the bole being 242 feet, and its girth was 40 feet; another was 159 feet to the first branch, and 269 feet total height, with a diameter of 17 feet 8 inches, at 4 feet 3 inches from the ground, and 14 feet at the centre of the bole, the bole alone yielding 30,000 superficial feet of timber. Other Karri trees in recent years have yielded up to 25,000 super feet. Karri matures in about forty years, and in the natural state it is safe from fire. In company with Jarrah and Red Gum (*Euc. calophylla*) Karri grows in the south-west district of Western Australia. Its timber is deep red in colour, hard, heavy, and tough, with an exceedingly interlocked grain, and famous for building purposes. Its strength as an air-dried beam is remarkable and Karri house-beams are as popular as Jarrah, but though its timber is hard it does not resist damp; despite this it is sometimes used for wooden water-pipes, and it has been substituted for Jarrah for railway sleepers, but is not so durable for that purpose. Air-dried Karri is only seventh on the list of the world's timbers for weight, but fourth for strength as a beam. Karri bark is useful for tanning leather. Wandoo, or White Gum (*Euc. redunca*) of Western Australia comes second to Jarrah as timber which it closely resembles, having many of its characteristics. It extends into drier forests, seasons the best, and has been classed with Jarrah as a railway sleeper with a durability in the ground of forty to fifty years—longer even than Jarrah. It has been used with the Tuart timber to replace steel in truck construction. Another species, Powder-bark Wandoo (*Euc. accedens*), a tree of 60 to 80 feet with a 4-foot diameter, is similar to the other in every respect, except that its bark is powdery on the outer layers, rubbing off at the touch. Its timber is similar and said to be even better than Jarrah and slightly redder in colour. Some Wandoo trees have reached 120 feet in height, the branches are wide-spreading and the pendulous foliage is large and bluish-green. The bark of the young trees is often rough and fibrous, but becomes smoother after about fifteen years. The presence of Wandoo always indicates the existence of pipe-clay in the soil. Tuart is described among the Gum trees called Box. Another Western Australian tree is the York Gum (*Euc. foecunda*, variety *loxophleba*), 40 to 50 feet high, with a diameter of 3 feet. It grows in the York district from which it takes its name. The trunk is usually crooked, the bark light gray, rough, furrowed

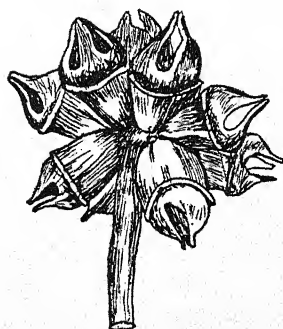
and persistent; the wide-spreading branches smooth. The timber is dark yellowish-brown, very dense and hard, strong, with wavy interlocked grain, and is considered one of the toughest of our timbers.



U.S.A. Bureau of Forestry, photo.

Eucalyptus gomphocephala ("Tuart")

(See page 50)



Euc. cornuta

A better-known tree than the York Gum is the Yate (*Euc. cornuta*), a fast growing, hardy species, adapting itself to low rainfalls of 15 or 20 inches, and varying from 30 to 100 feet in height, with white or yellow flowers clustered like those of *E. Lehmanni*, but much smaller; it has a particularly strong timber, specially valuable for constructional purposes but not comparable with Jarrah or Wandoo for durability in the ground. It has a tensile strength almost exactly half that of wrought iron, bulk for bulk, but weight for weight it has three times the tensile strength

and nearly four times the transverse strength. Flat-topped Yate (*Euc. occidentalis*) is 60 to 70 feet high with rough longitudinally-fissured bark on the trunk and bases of branches, but smooth and reddish-gray on the upper branches. The timber is yellowish-brown and extremely hard, like *Euc. cornuta*.

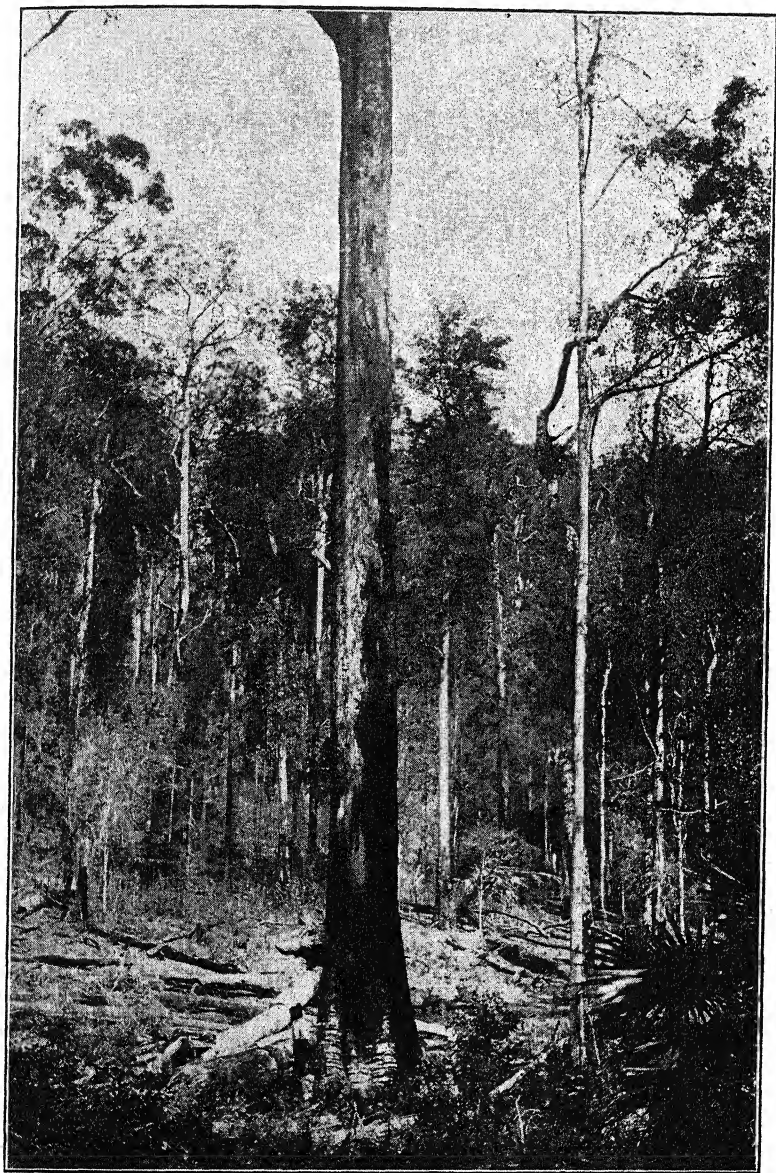


N.S.W. Government Printer, photo.

Eucalyptus Jacksoni ("Red Tingle") Forest

(See page 46)

The Yate Gum grows usually in small forests and to no great size. When cut or burnt it does not come up again as freely as Jarrah, so it is being lost to the Jarrah forests, occurring now only in patches on the seaward and landward side of the Jarrah belt. It grows on poor, sandy soil and is sensitive to frost.



Australian Forestry Journal, photo.

Eucalyptus acmenioides (White Mahogany)

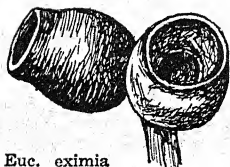
(See page 48)

There are a few more notable Western and Northern Australian Eucalypts of which mention must be made briefly, such as the well-known "Coolibah," (*Euc. microtheca*) which is usually 80 feet high but has been known to reach 150; it resists extremes of temperature and is remarkable in that it possesses a timber that is probably the hardest and densest in the world, and most difficult to work, its weight having been given as 89 lb. against 70 lb. for *Lignum-vitae*, and its ultimate strength, tested as a beam, is 14,460 lb. per square inch, its tensile strength being 13,470 lb. "Marri," a Red gum (*Euc. calophylla*) has handsome leaves and white flowers produced every three years, and a beautiful red flower in two varieties. Tingle-Tingle (*Euc. Jacksoni*) native to Western Australia, is an imposing tree of the Red species, with a good timber, likely to prove the most valuable of hardwoods for furniture and interior fittings, light in weight and extremely tough when dry. The so-called Mallet gums are often found with Wandoo, the three most important of the four species being the Brown Mallet (*Euc. occidentalis*) variety *astringens*, attaining up to 70 feet in height, with large, shiny, dark-green, lanceolate leaves and fairly thick bark; the Blue Mallet (*Euc. Gardneri*), a slender tree, 30 to 35 feet; and the White Mallet (*Euc. falcata*) of similar dimensions. The areas in which the Mallets grow are very limited. The timber is strong and long-grained, but not durable in the ground, and the bark is used for tanning purposes, mixed with other materials.

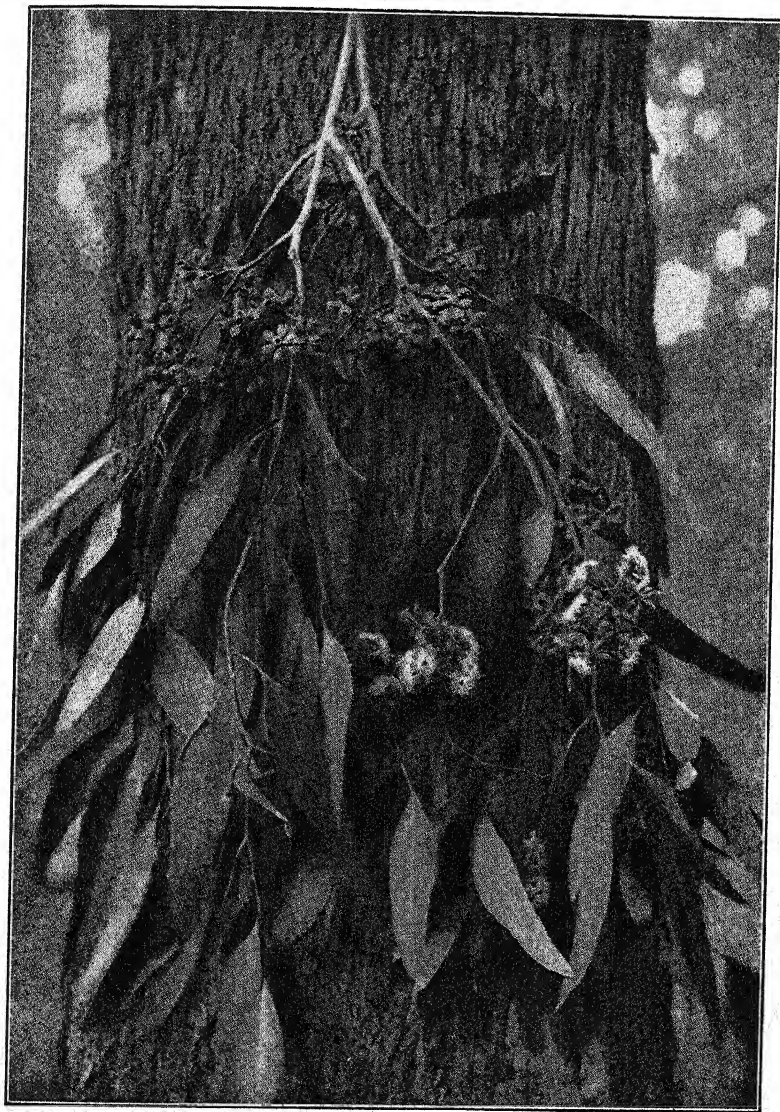
The Eucalyptus trees may be classified according to their timbers and barks as Bloodwoods, Mahoganies, Boxes, Tallowwoods, Stringy-barks, Woollybutts, Blackbutts, Gums, Pepper-mints, Ashes, Mallees and Ironbarks. By this method, a brief record is given of the salient characteristics of the more important Eucalypts, other than those already dealt with.

THE BLOODWOODS

The Bloodwoods which are few, grow in a curve through East Queensland to Western Australia, with a narrow belt on the border of New South Wales and Victoria. Their timbers vary in colour from deep red (*Euc. corymbosa*), lighter red (*Euc. intermedia*) to almost white (*Euc. eximia*).



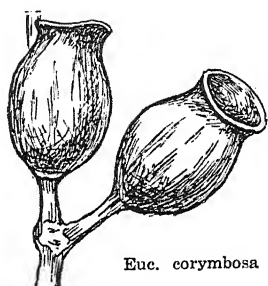
Euc. eximia



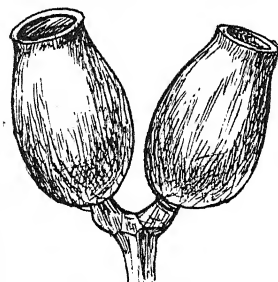
U.S.A. Bureau of Forestry, photo.

Flowers, Fruit, Leaves and Bark of
Eucalyptus hemiphloia (Forest Box)

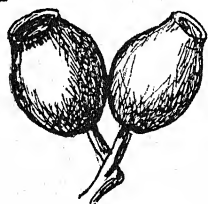
(See page 52)

*Euc. corymbosa*

Euc. corymbosa (flowers in corymbs) grows to 80 or 100 feet in North Australia, Queensland and New South Wales, with a timber of a dark-red colour and cross-grain figure invariably full of gum-veins which makes it durable and waterproof, but it is coarse in texture.

*Euc. terminalis*

Euc. terminalis (flowers terminal): A fair-sized tree closely allied to *Euc. corymbosa*, known as "Kutchu" and native to N.S.W., Queensland, South Australia, North Australia and Western Australia. It has a light-gray, smooth bark, leaves lanceolate, light-yellow in colour, about 4 inches long, fruit urn-shaped. The timber is red coloured, durable and useful for a number of purposes, but subject to gum veins.

*Euc. intermedia*

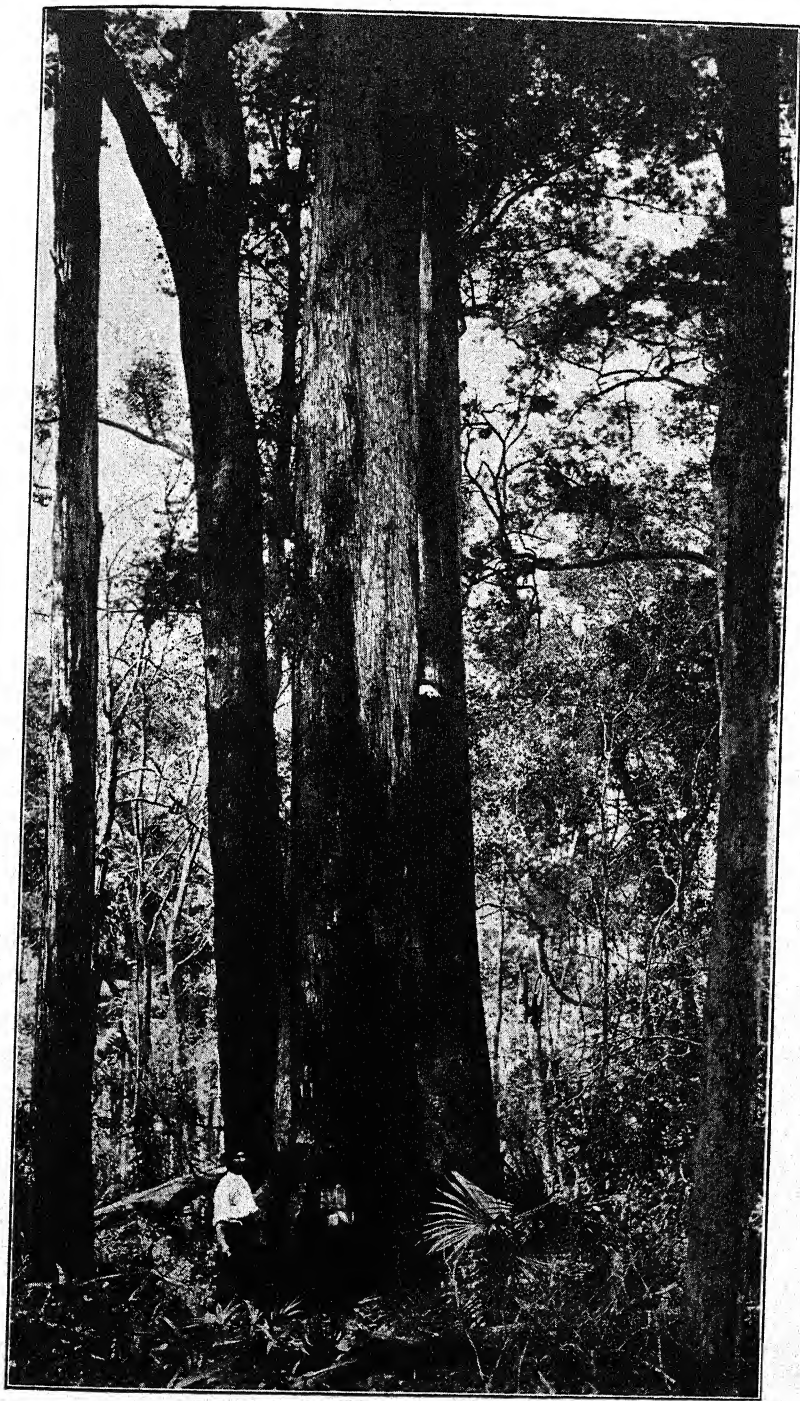
Euc. intermedia (intermediate): A fair-sized tree with a light brown fibrous bark, known as Bloodwood or Bastard Bloodwood. The leaves are lanceolate, acuminate, 6 inches long, and 2 inches wide; the flowers in large, terminal corymbs, the fruit urceolate. The wood is pale-coloured hard, straight-grained, and considered a good durable timber.

Euc. trachyphloia (rough-barked): A tree of moderate size, known as White Bloodwood, native to Queensland and common in southern localities. It has a persistent, fibrous bark, leaves lanceolate, 4 to 6 inches long, flowers in terminal panicles of 4 to 8, fruit ovoid, truncate.

THE MAHOGANIES

There are several Mahoganies, though the name is not very appropriate.

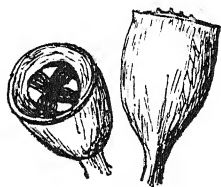
Euc. acmenioides (Acmena-like): A small or in some localities large tree, with persistent fibrous bark, known to forestry as White Mahogany. It grows on the coasts of New South Wales and Queensland to 80 feet and has stringy bark. Wood of a gray colour, close in grain, hard and durable; used in housebuilding.



Australian Forestry Journal, photo.

Eucalyptus resinifera (Red Mahogany)

Euc. robusta (robust), called Australian Brown Mahogany, grows from 100 to 150 feet high on swampy ground and river flats on the east coast of New South Wales. It has coarse leaves and reddish bark; its timber is difficult to season but it works up well and takes a good polish, and is useful for carriage, bridge and shipbuilding.



Euc. robusta

Euc. resinifera (resin bearing), known as Red Mahogany and Brown Mahogany, also Botany Bay Kino Gum, is one of the largest trees growing on the coast of New South Wales to Queensland from Port Jackson to Rockingham Bay, and reaching 150 feet in height with a diameter up to 6 feet. Its timber is strong and durable, and largely used for building purposes, though liable to be affected by borer insects. It dresses well and takes a good polish and was one of the first timbers to be exported. The aborigines obtained from it and from *Euc. obliqua* the large slabs of bark of which they made their canoes.

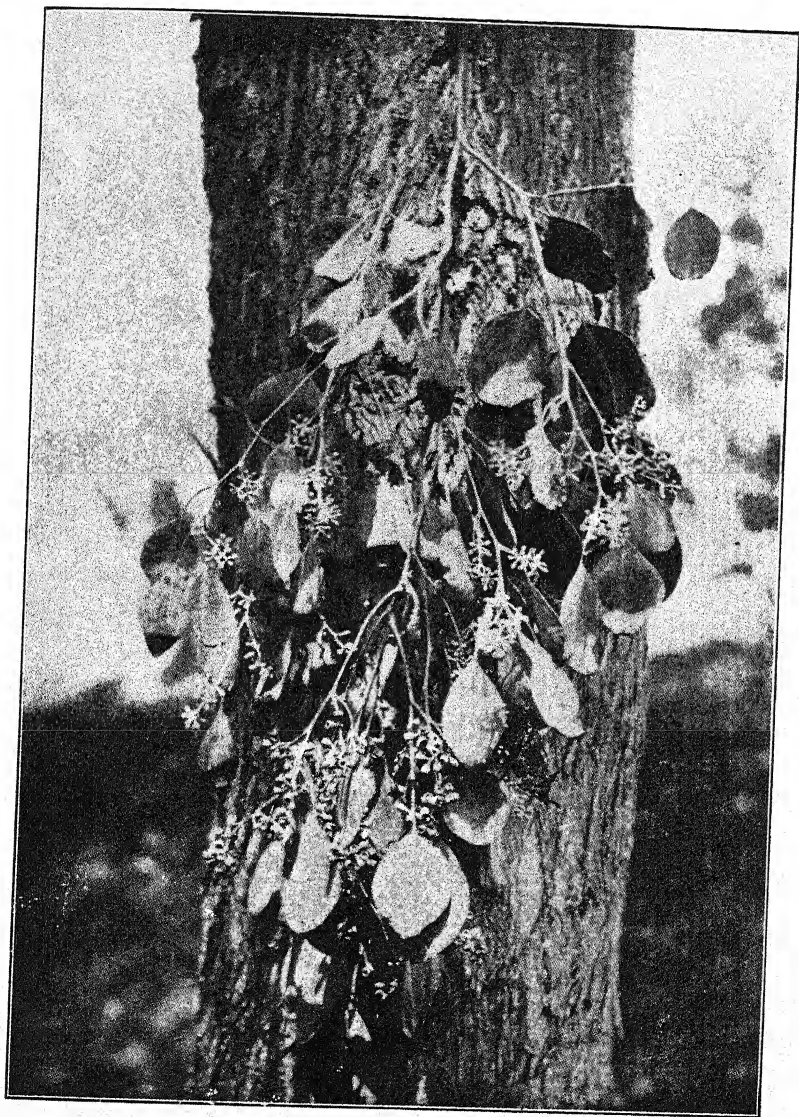


Euc. resinifera

THE BOXES

Euc. gomphocephala (head bolting together), known as Tuart, is an important tree of Western Australia, though confined to small patches of the lime-stone belts (about 7500 acres) along the coast between Perth and Busseltown—the only Tuart forest in the world. This fine tree grows to 150 feet in height and 20 feet in girth, with pale gleaming bole, and its thick shiny leaves are often 6 inches long. The trees seem all over 50 years old and there is a total absence of young trees; this has apparently been caused by continual grazing and repeated bush-fires. The grayish-yellow wood is one of the toughest and densest in the world, weighing 71 lb. per cubic foot air-dry. It seasons and works well, and is excellent for the construction of waggons and railway trucks, etc. Tuart has been planted to some extent in South Africa, California, and in Southern Europe.

Euc. melliodora (honey-scented), called Yellow-Jacket and Yellow-Box, grows on the tablelands from Victoria to Queensland, to an average height of 60 to 100 feet with timber of a yellow colour, useful for heavy work, and when dry is extremely hard, heavy and of remarkable toughness. Flowers in axillary clusters, sometimes with red stamens.



U.S.A. Bureau of Forestry, photo.

Fruit, Leaves and Bark of
Eucalyptus polyanthemos (Red Box)

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Euc. hemiphloia (half-barked) : A tree reaching to a height of 90 feet with a stem diameter of 4 feet and trunk about 50 feet high. It grows in Victoria, South Australia, New South Wales and Queensland, and is famous for the hardness and toughness of its timber which is used for railway sleepers, telegraph poles, shafts, spokes, malls, and is excellent for fuel. Its popular fragrant flowers of varying colour are of especial value to apiarists. The honey harvested by bees from any given area of "Gray Box" country is generally of greater monetary value than that which would be obtained in wool value from the grass in the same area. In some seasons the value of honey production would be more than if the land were cleared and cropped with wheat.

Euc. polyanthemos (flowers numerous) grows in Victoria, New South Wales and Queensland to 150 feet in height, and is known as Red Box, Brown Box, Gray Box and Bastard Box. The timber is hard, durable, close-grained and used for posts, building purposes, malls and railway sleepers. It polishes well but is rather subject to gum veins. It flowers profusely, and is valuable to beekeepers.

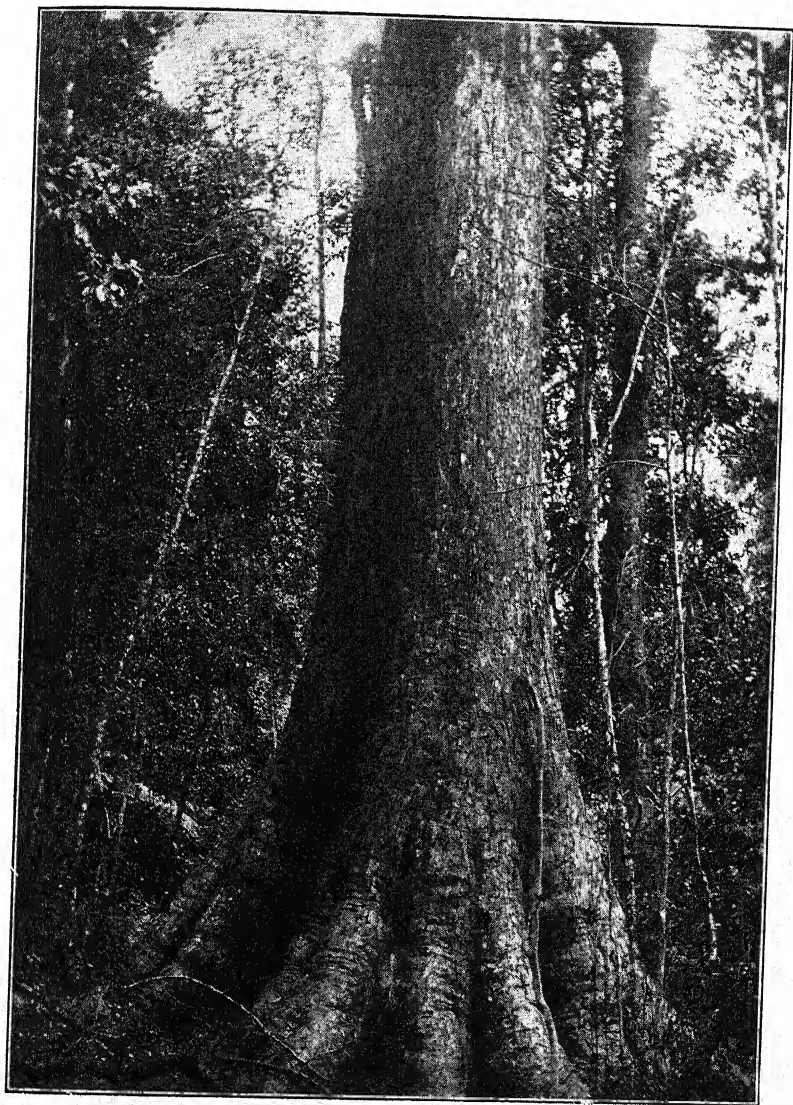
Euc. Bosistoana (after Joseph Bosisto), the Gippsland Box, is a very fine tree, growing as high as 200 feet in favourable situations, with a good circumference, sometimes over 10 feet in diameter. Its leaves vary in shape, but in the older trees are usually long and slender. It grows in Victoria and also in the south-coastal hilly districts of New South Wales, and its pale pink coloured timber is suitable for large structures such as bridges, waggons, sleepers, piles, etc., as it is extremely hard and durable.

Euc. Stuartiana (after C. Stuart), is a tree 50 to 80 feet high, known as Apple Box, and native to Victoria, New South Wales, Queensland, South Australia and Tasmania. It has rough and somewhat stringy bark on the trunk, leaves ovate-lanceolate 3 to 6 inches long, flowers in clusters of 4 to 8 on axillary peduncles, fruit almost turbinate. The wood is grayish, hard, and useful for posts and flooring boards.

Euc. albens (white), known as White Box, is a tree attaining a height of 60 to 80 feet, with a dull-gray or whitish, persistent bark, and leaves up to 6 inches long. The flowers are in clusters of 4 to 8 on peduncles $\frac{3}{4}$ inch long, and the fruit obovoid-oblong, about $\frac{1}{2}$ inch long. Timber hard, close-grained and durable. This tree is indigenous to the Eastern States.

THE TALLOW-WOODS

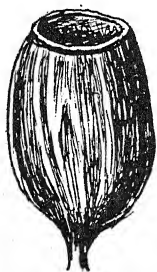
Euc. microcorys (small operculum) is so called on account of the greasy "feel" of its wood. A splendid tree, very distinct, growing to over 150 feet in exceptional cases with a diameter



N.S.W. Government Printer, photo.

Eucalyptus microcorys ("Tallow-wood")

up to 8 feet. It has leaves over 6 inches long, and flat fibrous bark. After Ironbark it is considered the most valuable of our hardwoods, and the timber is used extensively for flooring, wheels, waggons, and railway sleepers. It grows in a narrow belt on the north coast mountain slopes and tablelands of New South Wales into Queensland.

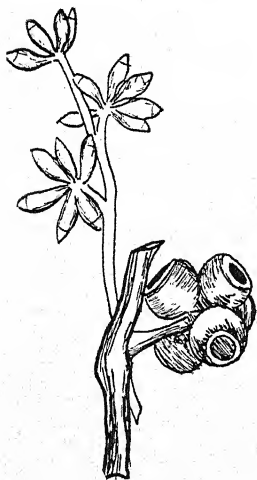


Euc. Planchoniana

Euc. Planchoniana (after Dr. J. E. Planchon): Another Tallow-wood, not so well known, but a good class of tree, 80 to 100 feet high, growing in New South Wales and Queensland. It has a stem diameter of 3 feet. The timber is sound, heavy, hard and durable, well adapted for sawing, but not easy to split.

THE STRINGY-BARKS

Euc. capitellata (flowers in small heads), known as Brown Stringy-bark, grows on poor, sandy or rocky soil to a height of from 50 to 120 feet throughout the south-eastern districts. Its timber is tough, hard, strong and durable, usually splitting readily, brown when fresh, paler when dry, and used for building and furniture.



Euc. eugenioides

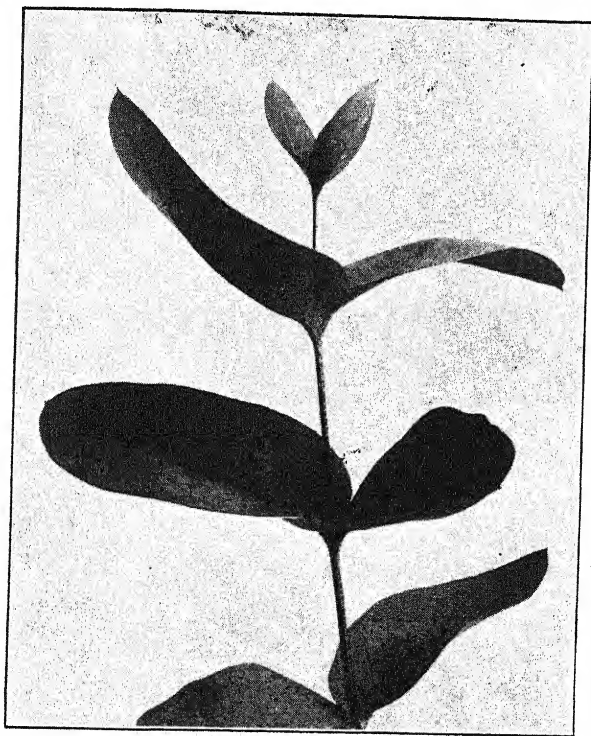
Euc. eugenioides (resembling a *Eugenia*), the White Stringy-bark, is a graceful, straight, slender tree which is plentiful on the east coast and attains 100 to even 200 feet in Victoria. The timber is straight and somewhat reddish in colour, ranking as the strongest of the Stringy-barks, and one of the best for house building and for flagstaff poles as it is durable in the ground.

Euc. macrorrhyncha (large beak), Red Stringy-bark, grows 50 to 100 feet on sandstone ridges, widely spread over the Eastern States. It has a reddish timber which saws and splits well; heavy, strong, and very valuable for building purposes; making fine weatherboards, girders, also fencing-posts, as it stands long in the ground.

Euc. Muelleriana (after Baron von Mueller), the Yellow Stringy-bark has been recorded up to 200 feet high, and is found on the sandy soils of South Gippsland, Victoria, where it is plentiful, and in Tasmania, also in New South Wales, South Australia, and to some extent in Queensland. It supplies

a valuable timber similar to Blackbutt, free-working and suitable for house and bridge building, fencing and railway-sleepers.

Euc. obliqua (of unequal sides), "Messmate" Stringy-bark, is one of the best known of the Stringy-barks. It gets its popular name from its sociable character, as it grows among other species and not in its own forests. It is especially large and abundant in Tasmania, favouring the uplands but not the hill-tops, and occurs everywhere in Victoria but the north, also (but not abundantly) in New South Wales and South Australia. It is hardy, handsome, and rapid-growing, with a



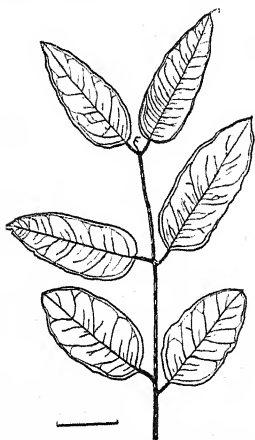
N.S.W. Government Printer, photo.

Eucalyptus piperita (Peppermint Stringy-bark)

straight clean bole, and large markedly-oblique leaves dotted with oil glands, and it frequently attains a height of 200 or 250 feet with a diameter of 6 to 12 feet. In the autumn periodically but not annually it has profuse honey-laden blossoms growing in clusters without stalks, and its bark is fibrous, matted, and of a grayish colour, and has been used by upholsterers as a stuffing for chair-seats. Its valuable reddish-

brown timber is liable to the attacks of borers in the sapwood, but the heartwood is durable in the ground, strong, tough, straight-grained and very fissile. It is used for joinery, internal fittings, etc., and extensively for palings and in building, but is more durable in Tasmania than on the mainland.

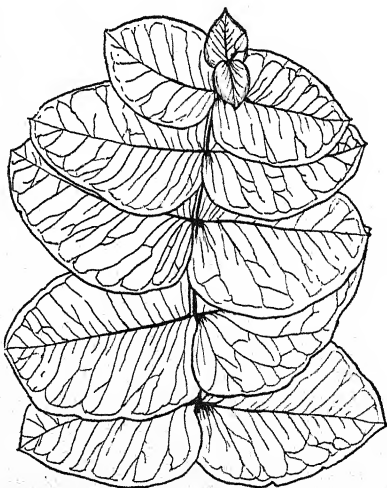
Euc. piperita (peppermint-scented): A fair-sized tree, attaining a height of 100 feet, known as Peppermint Stringybark, and native to Victoria, New South Wales and Queensland. It has persistent fibrous bark on the trunk, leaves 2 to 6 inches long, ovate-lanceolate and very oblique, flowers in clusters of 6 to 12 on axillary peduncles, fruit obovoid-globular, 2 to 3 lines in diameter. The timber is pale, hard, straight-grained and liable to gum veins.



Euc. Baileyana

Euc. Baileyana (after F. M. Bailey): A tall tree rising sometimes to a height of 150 feet with a stem diameter of 4 feet, and indigenous to New South Wales and Queensland, and known as Black Stringybark or Rough Stringybark. It has rough, persistent, fibrous bark, leaves falcate-lanceolate 3 to 5 inches long, $\frac{1}{2}$ to 1 inch broad, green on both sides, and fruit globose. The timber is light-gray, tough; suitable for tool-handles and other purposes.

Euc. cinerea (ash-colour): Known as Mealy Stringybark and native to Victoria and New South Wales, a moderate-sized tree, 30 to 50 feet high, with a reddish-brown persistent bark smooth and white on the smaller branches. The leaves are grayish-green, 2 to 4 inches long, from ovate to lanceolate, the flowers with short pedicels (in clusters of 3 to 7), on axillary peduncles, the fruit semi-globose, $\frac{1}{4}$ inch diameter, with valves projecting. Timber reddish and not very durable, useful for firewood and rough general use.

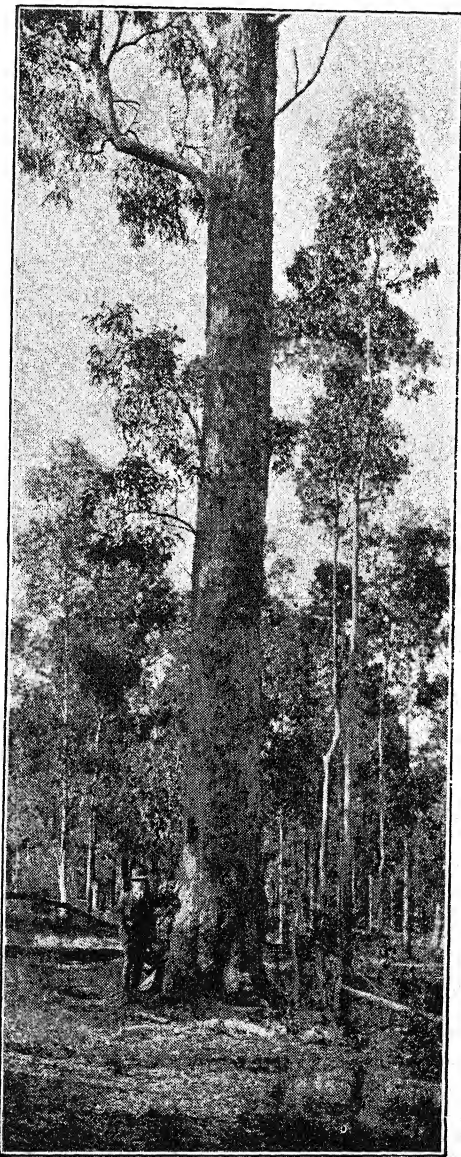


Euc. cinerea

THE WOOLLY-BUTTS

Euc. longifolia (long-leaf) is a long-leaved tree growing to 100 or 150 feet and native to New South Wales. It has reddish, durable timber, suitable for cabinet-work, as well as posts and sleepers; though it is the lightest of the Eucalypt timbers (weighing 43 lb. per cubic foot), it is the strongest—its stress being 12,185 lb.

Euc. pilularis (fruit globular), the Blackbutt is one of the tallest trees in this group, reaching in exceptional cases to 300 feet with a diameter of about 15 feet, but it is usually 90 to 200 feet high. It grows rapidly and is native to New South Wales and Victoria, taking its name from its black or very dark stringy-bark on the lower stem. It has broad buttresses up the trunk, and is one of the best of the hardwoods, light in colour, straight-grained, strong, and very durable in the ground; much used for house and ship building, also for wood-paving and railway-sleepers and for pulping for the making of paper.



N.S.W. Government Printer, photo.

Eucalyptus longifolia (Woolly-butt)

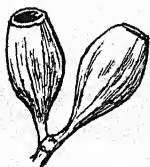


Eucalyptus citriodora (Lemon-scented Gum)

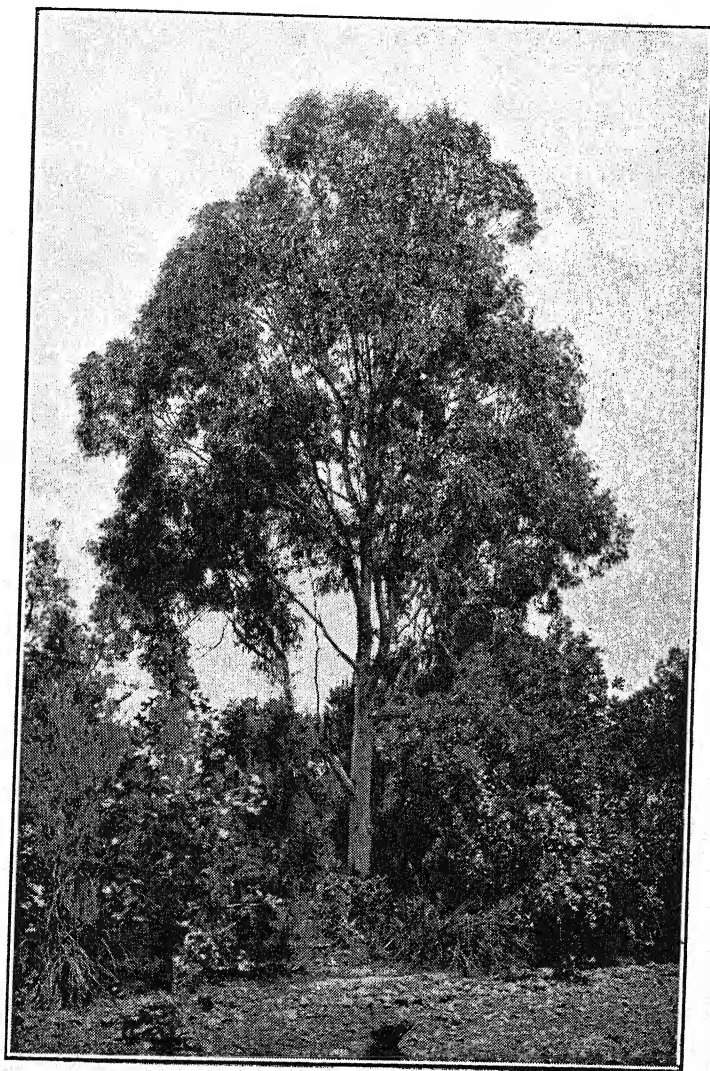
THE GUMS

Euc. citriodora (citron-like), the Lemon-scented Gum, is a fairly tall tree with smooth, whitish bark and has long, olive-green leaves which, when crushed, have a sweet lemon scent. It is a very graceful tree, especially when young, and reveals a handsome, silvery-pink, naked trunk when the thin bark curls and peels off in the summer. Its natural range is on the north coast of Queensland, but it is planted freely in the other States, and is also popular in other countries such as Africa, where it is much appreciated for street decoration.

Euc. cladocalyx (branch cup), known as Sugar Gum, is a native of South Australia, though seen abundantly in the other States, being much grown in gardens and public places. It is a rapid grower, handsome in appearance when cultivated and well pruned, its longer branches being brittle and liable to break off close to the trunk. It can be used as a hedge, is excellent as a break-wind and ready shelter on farms as it grows to 50 feet at least, though somewhat irregularly.



Eu. cladocalyx



N.S.W. Government Printer, photo.

Eucalyptus citriodora (Lemon-scented Gum)

Euc. radiata (passing in a straight line from centre), the graceful, drooping River White Gum, is even better for hedges as it is not so liable to attack by insects. The bark is dark at the butt, smooth after the first 10 to 30 feet and then peeling off in long flakes; the leaves 2 to 6 inches long generally narrow but occasionally an inch in width. The timber has been used successfully for making pick-handles, otherwise it is not very valuable, and needs to be well selected and well matured, but it is hard and durable. This tree is plentifully cultivated in South Africa, where it does better than any other in the dry coastal districts.

Euc. globulus (button-like), the well-known Australian Blue Gum, called "Ballook" by the aborigines, is a very rapid grower, decorative when young but rather straggly later. It is native to south-east New South Wales, Victoria and Tasmania and is planted nearly all over Australia and the Pacific Islands, also in Italy, Spain, the South of France, California, the Cape of Good Hope, Southern India, and in Algeria, proving its adaptability to soils and climates. Called the Fever Tree in India, it is planted there in swampy country as a preventative against malarial fever and for reclamation purposes, as it readily absorbs moisture. It is considered one of the world's finest trees. It has smooth, whitish-blue bark, the leaves are sometimes as long as 18 inches, the top of



Euc. globulus

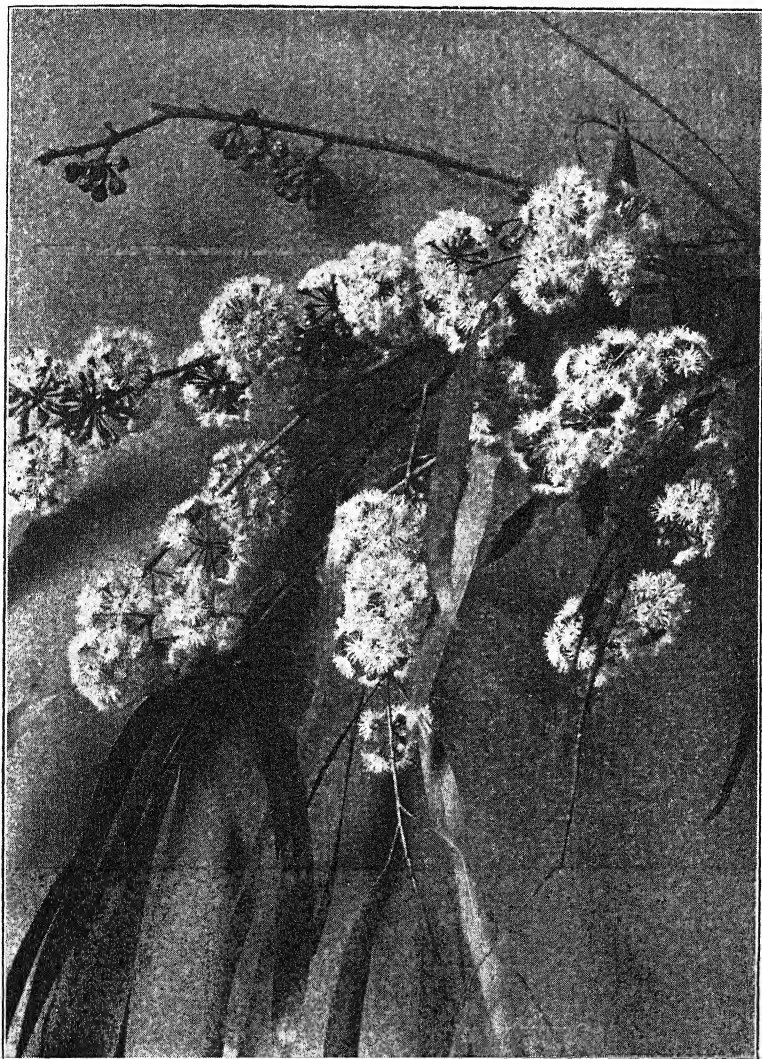
the whitish-green seed-vessel resembles a button (hence its specific name) and the timber when dry is as strong as the English Oak, which it resembles somewhat in grain, and it is very much used here as planking for buildings, railway sleepers, etc., and handles for large tools have been cut from the better small parts; the young timber has been successfully tested for pulping in the making of paper.

Euc. bicostata (twice-ribbed), Victorian Blue Gum: A close relative of *Euc. globulus* and has similar uses.

Euc. gonicalyx (angular calyx), the Gray Mountain Gum, reaches 250 feet in height and is very conspicuous in gullies, especially on basalt or granite ridges in the hilly country of the south-east of Australia,



Euc. gonicalyx



E. E. Pescott, photo.

Buds, Flowers, Fruit and Leaves of
Eucalyptus radiata (River White Gum)

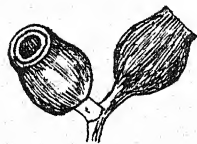


U.S.A. Bureau of Forestry, photo.

Eucalyptus leucoxylon (White Wood)

from the Blue Mountains of New South Wales, through Victoria and into South Australia. It grows at elevations of even 4000 feet, but thrives best in damp situations. The leaves are very large, sometimes as long as 2 feet and 3 inches broad, and the bark is smooth except for a few feet from the roots. The timber is hard, tough, and exceedingly durable. Many other species are also called Mountain Gum, but this is the most important.

Euc. maculata (spotted), is an ornamental tree, well known in forests chiefly from the Brisbane River, southern Queensland, to the southern coast of New South Wales, but found all over Australia, and sometimes called Mottled-Bark Gum, its bark being smooth and dull lead-coloured and flaking off in irregular patches. It is also known as Australian Hickory, and claimed to rank next to American Hickory. It grows to 100 or 150 feet, with large glossy leaves sometimes a foot long by 3 inches broad. The timber is of a brownish colour,

*Euc. maculata*

somewhat like the English oak, with a pleasing wavy, open grain, though it does not polish well, but is strong and much used by wheelwrights, shipwrights and house-builders; latterly it has been found suitable for parquetry, cabinet-work, furniture, etc., and its toughness makes it useful for axe-handles. The sapwood is liable to be infested with borer insects.

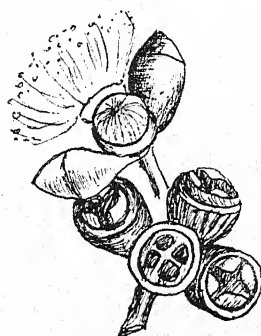
Euc. leucoxylon (White Wood): The Blue Gum of South Australia known in Victoria as the Yellow Gum, grows mostly in South Australia but also in New South Wales and Victoria, to about 100 feet, having a smooth bark, dull, olive-green leaves and fine, large, white flowers, its variety *rosea* producing red or pink flowers. Its pinkish timber is very durable, and useful for rail-sleepers, bridge-piles and waggon-shafts.



Euc. populifolia

Euc. populifolia (Poplar-leaved), the Gray Gum or Poplar-leaved Gum, is a fine forest tree on the north-coast of New South Wales and also growing in Queensland, of great commercial value. Its reddish timber is hard and close-grained, seasons and works well—a first-class wood for house and coach building, heavy joinery and constructional work. The tree grows symmetrically to over 130 feet high and 5 feet in diameter. The gray bark peels off in large patches, leaving a smooth white surface, and the leaves are very uniform of an average length of 4 inches by 2 inches with very prominent veins.

Euc. punctata (marked with dots) is a large tree of the New South Wales and Queensland coasts, a rapid grower, the timber of which is excellent for sleepers, hard and of a deep-red colour suitable for heavy constructional work. It is known as "Leather Jacket" owing to its tough bark.



Euc. punctata

Euc. saligna (willow-leaved), the Sydney Blue Gum or Willow-leaved Gum, is a tall tree with smooth bluish-white bark, growing at the heads of the gullies on the New South Wales and southern Queensland coasts only. It has timber which is strong, durable and reliable; the rich-red wood works up well for cabinet-making, takes a good polish, its grain being straight and well marked, the figured portions mottled and very striking.

Euc. tereticornis (horn-like operculum), the Forest Red Gum of the coastal districts of New South Wales, Queensland

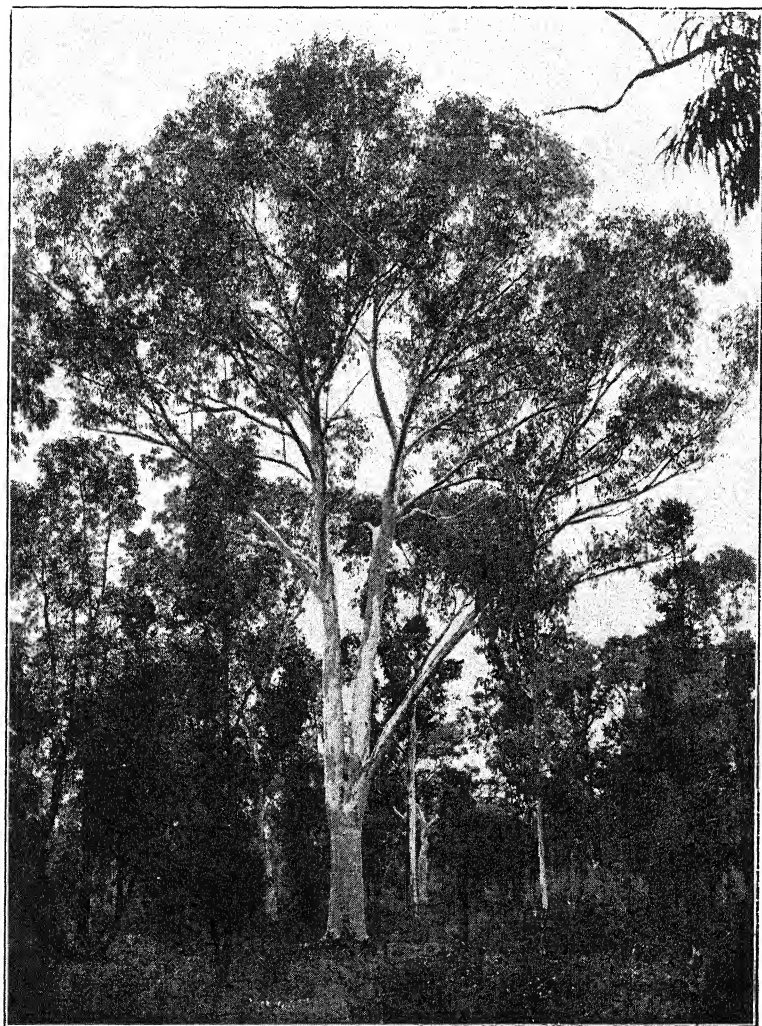


Eucalyptus ovata (Swamp Gum)

and Victoria, is a fine tall tree of 100 feet, with smooth bark. It grows on dry country but in a variety of soils and does well in South Africa; its timber is hard, red-coloured with straight grain, suitable for furniture as well as constructional work.

Euc. rostrata (operculum-beaked), the River Red Gum is one of the leading trees of the Australian continent and one of the most important of the whole genus. It grows to 100 feet and has hard, durable timber which brings to Australia by far the most revenue of all our trees, as it is used for so many purposes. The main usefulness of the timber is due principally to its durability, both underground and in water, it being used for ship-building, bridge-building, paving, telegraph poles, posts, piles, house blocks and street kerbing, etc. A cubic foot weighs 65 lb. green and 50 to 60 lb. air-dried. Next to Jarrah this is the best wood for resisting the attacks of sea worms and white ants.

Euc. ovata (ovate), known as Swamp Gum, White Gum, Blue Gum and Gray Gum, and indigenous to South Australia, Tasmania, Victoria and New South Wales, is a small to medium-sized tree varying from 60 to 100 feet in height, with a smooth bark, sometimes dark and furrowed at the butt. The leaves are ovate-lanceolate, 3 to 8 inches long, the flowers 7 to 10 altogether on axillary peduncles, the fruit sessile or shortly



N.S.W. Government Printer, photo.

Eucalyptus viminalis (White Gum)

stalked, conical to hemispherical, 3 to 4-celled, and the valves sunk or the tips slightly projecting. In fertile valleys it attains a considerable size but generally grows on cold, damp, undrained lands or flats subject to periodical waterlogging. The timber

is moderately hard, close-grained, durable and useful for fencing posts and rails.

Euc. viminalis (drooping): This tree is indigenous to south-eastern Australia. Near the coast it is only a small tree



Euc. viminalis

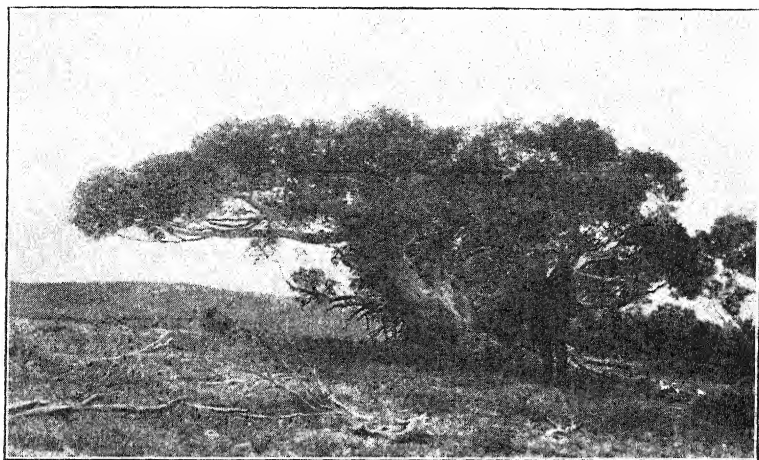
with a dark, rough bark on the trunk and generally known as "Manna Gum." In rich soil of the mountain forests it attains a very considerable size rising to a height of 200 feet or more, and a diameter of 8 feet, with a clear cream-coloured bark, and known there as White Gum. The leaves are lanceolate 3 to 6 inches long, the white flowers on short pedicels in clusters of 3 to 8. The timber is light-reddish and useful for rough building material, fence-rails, linings and inside work, also tool and pick handles and excellent for fuel.

Euc. coriacea (leather-like), known as Snow Gum, Drooping Gum, White Sallee, White Gum, Swamp Gum and Flooded Gum, a tree of handsome appearance 50 to 100 feet high, with a diameter of 2 to 3 feet, though much smaller on hilly ground. It has smooth, whitish, deciduous bark, the inner layers thick and brittle. The leaves are lanceolate-falcate, thick, smooth and shining, 4 to 8 in. long; the flowers white, 5 to 10 together on axillary peduncles, and the fruit pear-shaped. It usually occurs on basaltic soil and the foliage is eaten by horses, cattle and sheep. The wood is pale, rather soft, straight in grain, splits readily and is easy to cut, useful for fence rails and firewood, but valueless underground.

Euc. Ravertiana (after Dr. M. C. Ravert-Wattel): A tall erect tree reaching a height of 300 feet, with a trunk diameter up to 10 feet and dark persistent bark, the leaves are ovate to elongate-lanceolate, 3 to 6 inches long, $\frac{1}{2}$ to 1 inch broad. It is endemic to Queensland and known as Gray Gum, Iron Gum and Woollybutt. The wood is slate-coloured speckled with white, very hard and durable, useful for cabinet-work, piles, railway-sleepers and general building purposes.

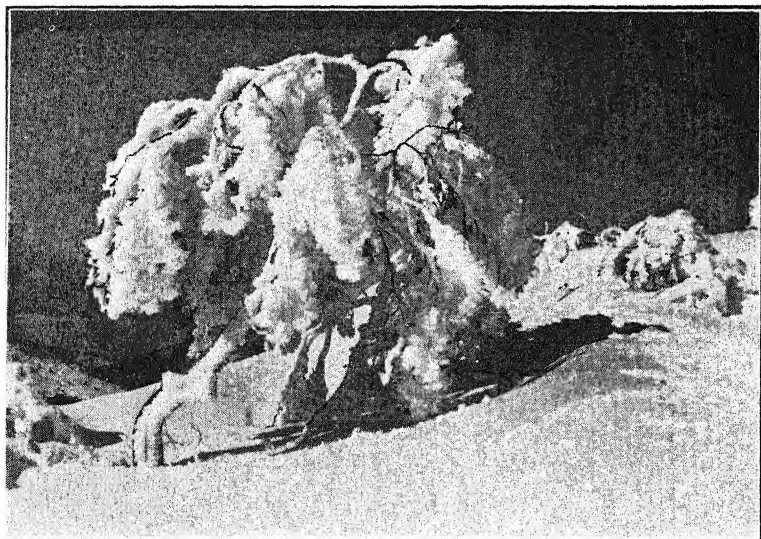
Euc. redunca (recurved or twisted), endemic to Western Australia and known as White Gum and "Wandoo," is a tree which attains a height of 150 feet and a diameter up to 15 feet. The bark is whitish and powdery, imparting a white coloration when rubbed. The leaves are ovate-lanceolate about 3 inches long, and the flowers grow in umbels of 6 to 12 on axillary peduncles. It supplies a pale, hard, tough, heavy and durable timber, useful for all kinds of wheelwright's work. The seasoned wood weighs about 70 lb. per cubic foot.

Euc. botryoides (resemblance to a bunch of grapes): Known as Swamp Mahogany, Blue Gum, "Bangalay" and Mahogany Gum, it is indigenous to Victoria, New South Wales and Queensland—a handsome tree, growing to a height of 60



R. H. Croll, photo.

Eucalyptus coriacea (Snow Gum) in Summer



"The Gum Tree," photo.

A Snow Gum in Winter on the Victorian Alps

to 100 feet, with a rough, furrowed, persistent bark. leaves 4 to 6 inches long, lanceolate, with divergent, parallel veins. The flowers are large, 4 to 10 together on short peduncles, the fruit obovoid, oblong, about $\frac{3}{4}$ inch long. The timber is hard, tough, durable, red to reddish-brown, close-grained, useful for ship-building, felloes of wheels, and all the heavier kinds of wheelwright's work.



Euc. alpina

Euc. alpina (alpine): A small tree, known as Grampians Gum, growing to 30 feet in height, and restricted to the Grampian Mountains, Victoria. The leaves are thick, broad, ovate or oblong, 2 to 3 inches long; the large, white flowers are solitary or 2 or 3 together, and the globular fruit about 1 inch in diameter. The tree is too small to yield timber of any commercial value.

Euc. rubida (red): A tree 30 to 50 feet high, with a smooth, white or pale-yellow bark, native to Victoria and New South Wales and known as Candle Bark. The leaves are 3 to 6 inches long, lanceolate, cordate, the flowers white, growing on short peduncles, and the fruit hemispherical. The timber is fairly tough and hard, with an open grain, and is useful only for fuel and rough building.

Euc. Gunnii (after Collector Gunn): A small tree 20 to 30 feet high, known as Cider Gum, and native to Victoria, New South Wales and Tasmania. The bark is smooth, leaves 2 to 3 inches long, linear-lanceolate to oblong, or ovate, the flowers white, usually in threes on axillary peduncles, the fruit turbinate. This tree is alpine in habit, growing on elevations up to 6000 feet, and is useful in arresting water erosion.



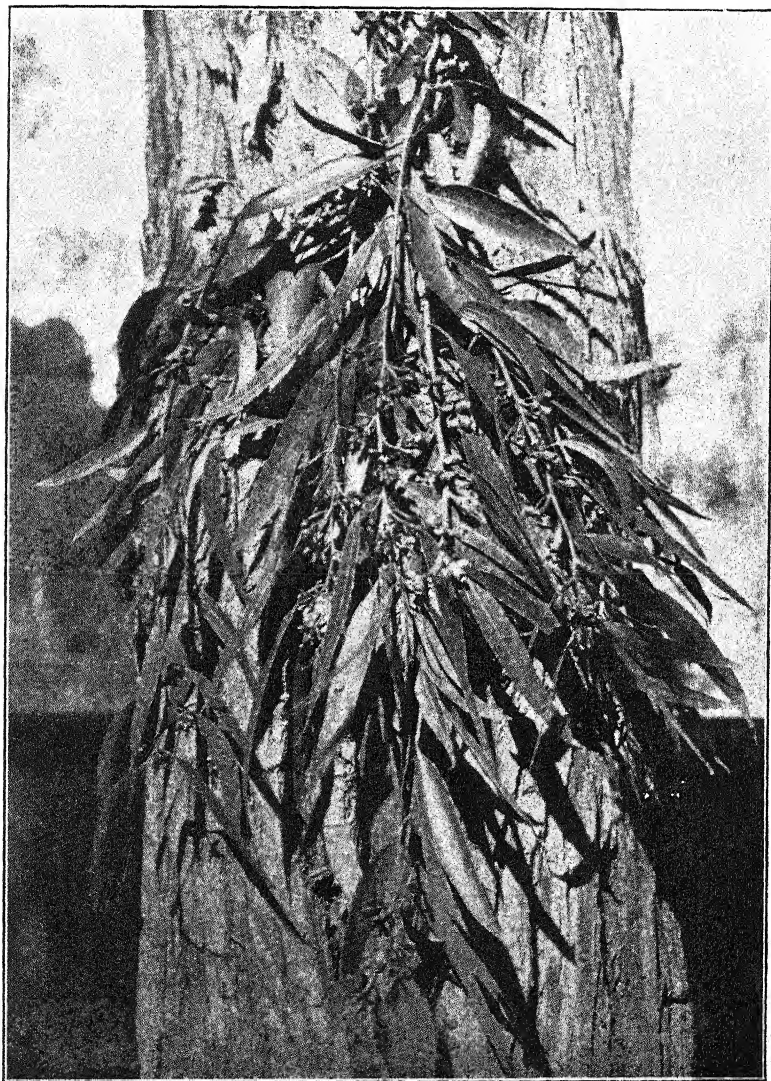
Euc. megacarpa

Euc. megacarpa (large fruit): A small tree, known as Blue Gum, and endemic to Western Australia. It has thick, smooth lanceolate leaves, 4 to 6 inches long, flowers sessile, two together on axillary stalks, and fruit globular. It is occasionally cultivated as an ornamental tree.



Euc. urnigera

Euc. urnigera (urn-shaped): A small tree sometimes attaining 50 feet in height, endemic to Tasmania and occurring in alpine districts. It has a pale, smooth bark, leaves ovate, oval-oblong or lanceolate, 2 to 4 inches long, flowers usually three together on rather long

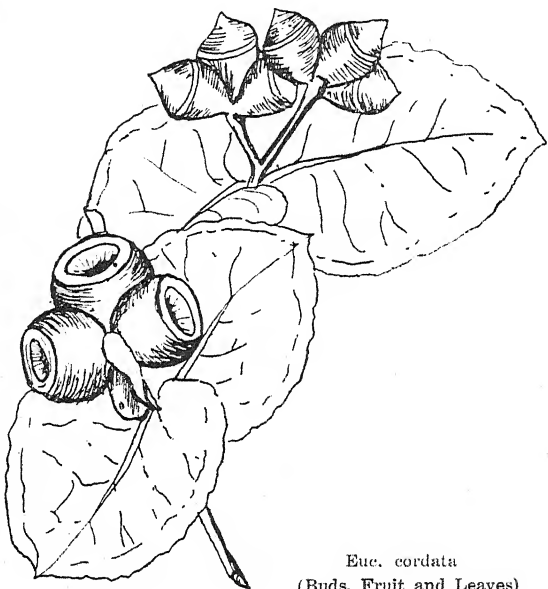


U.S.A. Bureau of Forestry, photo.

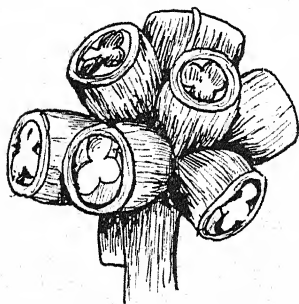
Fruit, Leaves and Bark of
Eucalyptus botryoides (Swamp Mahogany)

pedicels, fruit hard, oblong-ovoid or nearly globular and urn-shaped.

Euc. cordata
(heart - shaped) :
A small, glaucous
tree endemic to
Tasmania and
closely allied to
Eucalyptus cos-
mophylla. It has
smooth, decidu-
ous bark, leaves
opposite, cordate,
broadly ovate or
orbicular, 2 to 3
inches long, flow-
ers usually three
together on short,
axillary stalks
and bluish fruit
depressed - globu-
lar in shape.



Euc. cordata
(Buds, Fruit and Leaves)

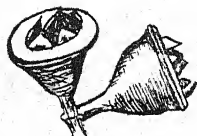


Euc. platypus

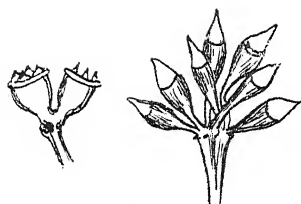
Euc. platypus (broad fruit),
known as "Maalok" or "Moort,"
a tree endemic to Western Australia,
attaining a height of 30 feet, with
a smooth bark and thick, smooth
leaves broadly ovate or orbicular up
to 2 inches long and flowers 3 to 7
on axillary peduncles and fruit tur-
binate.

Euc. Bauerlini (after W. Bauer-
lin) is a small tree, endemic
to New South Wales and known as
Brown Gum. It occurs in rocky

declivities on the Sugar Loaf Mountain at an
altitude of 2000 feet or more, and attains at
its lowest level a diameter of 2 feet and a
height of about 50 feet. The leaves are
somewhat shining on both sides and the fruit
under $\frac{1}{2}$ inch in diameter with valves pro-
minent and exserted.

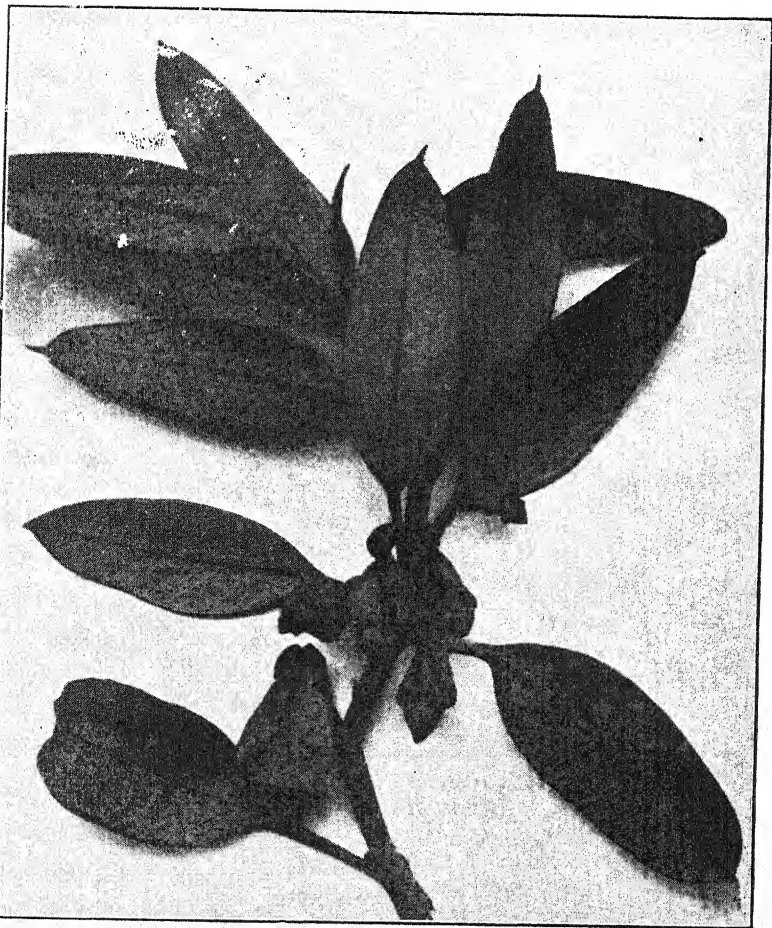


Euc. Bauerlini



Eucalyptus dealbata
(Fruit and Buds)

Euc. dealbata (silvery): This is indigenous to New South Wales and known as Cabbage Gum, White Gum, or Mountain Gum—a fair-sized tree 60 to 70 feet high, with a smooth bark (occasionally rough at the base) and leaves lanceolate, about 6 inches long, the fruit hemispherical about three lines in diameter, with rim thick and flat.



F. Chapman, photo.

Eucalyptus tetraptera (Leaves and Fruit)

Euc. haemastoma (orifice of fruit red), known as White or Scribbly Gum, and indigenous to Victoria, Tasmania, New South Wales and Queensland, is a large timber tree attaining a height of 120 feet with a smooth deciduous bark, which leaves a spotted or variegated trunk often showing insect markings similar to a "scribble." The leaves are lanceolate, oblique or falcate, about 4 to 6 inches long, thickly coriaceous, the flowers four to eight in a short, terminal, oblong panicle, the fruit pear-shaped, three to four lines in diameter, with rim broad, flat or nearly so, and red-coloured. The timber is of a gray or reddish colour, useful for furniture, 3-ply veneers, fence posts and building construction.

Euc. tetraptera (four-winged): A small tree, endemic to Western Australia and known as Four-wing-fruited Gum. It has thick, shining, oblong-lanceolate leaves 6 to 8 inches long, the red flowers large and sessile, the fruit prominently angled or four-winged, 2 inches long, with the capsule deeply sunk.

THE PEPPERMINTS

The Peppermints, which constitute a widely-distributed group of Eucalypts growing in the coastal districts of New South Wales and throughout Victoria and Tasmania in practically the opposite curve of distribution to the Bloodwoods, are a pale-coloured class of timber, their distinctive characteristics being the peppermint odour of the leaves.

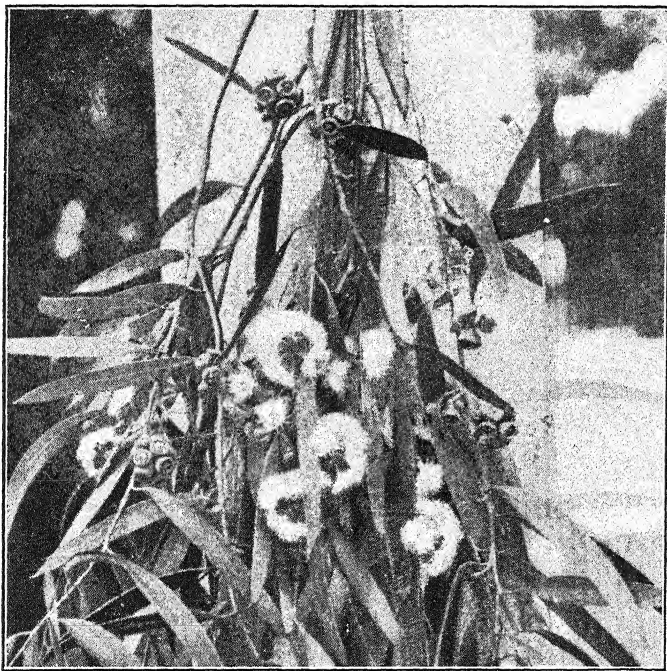
Euc. amygdalina (almond-shaped), the Almond-leaved Black Peppermint, grows chiefly in Tasmania, having a pale-gray stem and branches with narrow, dense, slightly drooping foliage, and a very light-brown timber which is useful for building purposes. It is a very graceful and ornamental tree.

Euc. australiana (Australian): This tree grows on the middle and southern ranges of New South Wales and Victoria, and is called "Messmate" (growing with other species of gum-trees) as well as Narrow-leaved Peppermint. It is sometimes as high as 200 feet but usually of medium size, with a fibrous bark growing compact on the trunk and branches; its timber is often sold as a substitute for American Hickory and the leaves yield 70 per cent. of essential oil.

Euc. Delegatensis (from Delegate Mountain), the Victorian Red Mountain Ash or Wollybutt, known also as Tasmanian Oak or Southern Mountain Ash (the grain of its timber having an appearance of the English Ash, but it looks like Oak when first cut and is used as a substitute for either). It is one of the best seasoning timbers, bends well, and does not warp if well seasoned; and is used extensively for furniture,

office-fittings, etc. The tree is a quick grower, reaches a good height, and has large lanceolate leaves.

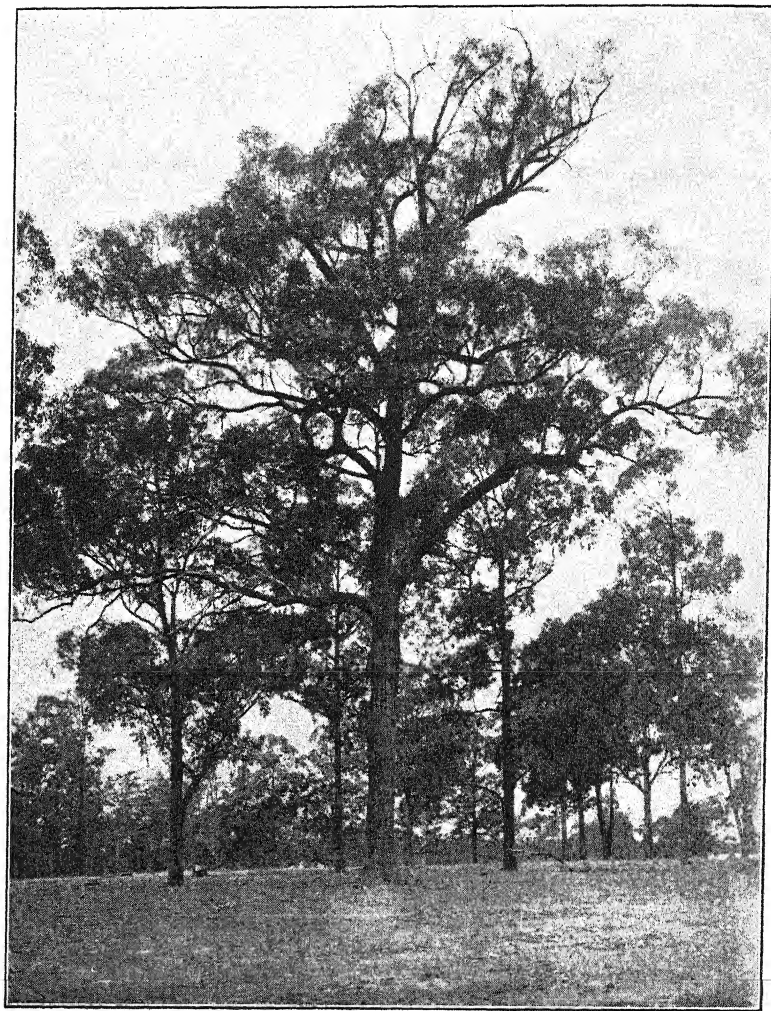
Euc. Sieberiana (after Sieber, a botanist): The Australian Mountain Ash of Tasmania and Silvertop of Victoria grows also in the east coast ranges of New South Wales and



U.S.A. Bureau of Forestry, photo.

Eucalyptus amygdalina (Black Peppermint)

in South Australia, favouring the mountain crests, but growing in lower positions in some parts. It is usually 70 to 80 feet high but occasionally 100 to 120 feet with dark, compact, deeply-furrowed bark by which it is easily recognised, as also by its livid red-coloured, terminal branches and large leaves. It is a fairly rapid and hardy grower, and its timber is hard, dark and occasionally marked with black spots, but first-class for general building purposes.

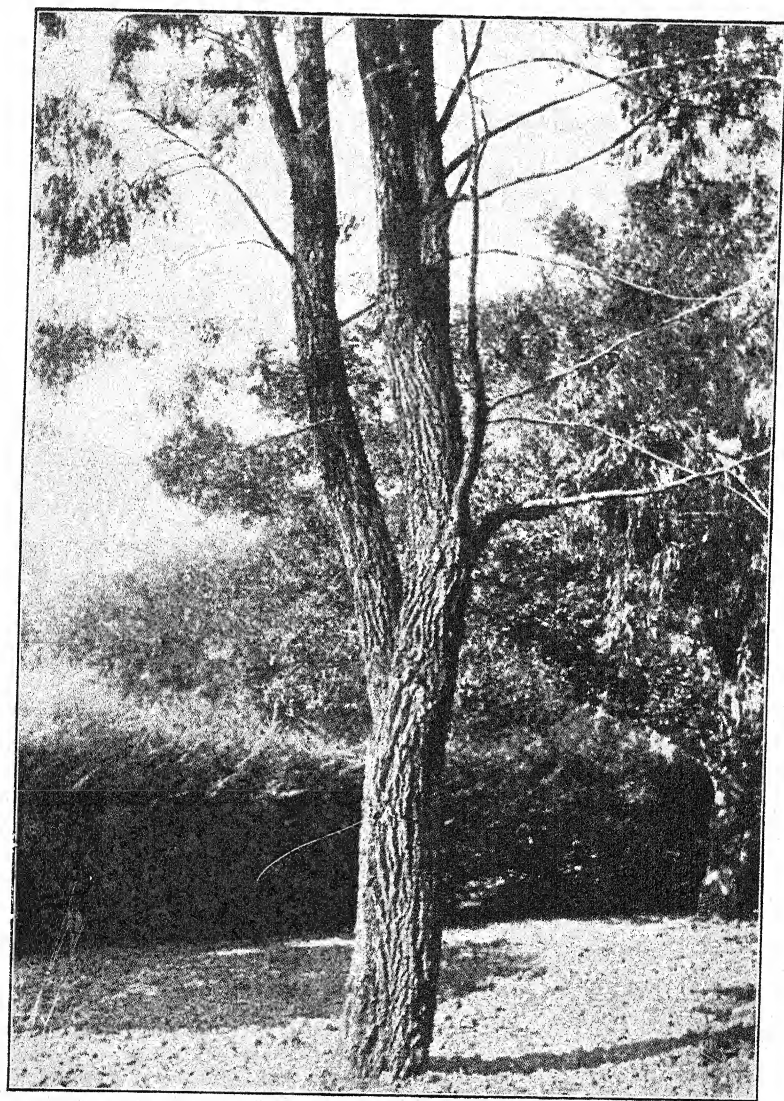


N.S.W. Government Printer, photo.

Eucalyptus crebra (Red Ironbark)

THE IRONBARKS

So called because of their thick, close, hard bark, they might also be called Ironwoods, for their timber is the hardest of all the Eucalypts, very heavy and durable and difficult to drive a nail into or to plane. They are white, gray, chocolate, pink, or red in the colour of their timber.



U.S.A. Bureau of Forestry, photo.

Eucalyptus Sideroxylon ("Mulga")

Euc. crebra (frequent), the Australian Red Ironbark or Narrow-leaved Ironbark, is one of the best and most widely distributed of all the Ironbarks, being found on both sides of the Dividing Range and in the interior, growing well in dry country. The bark is blackish and deeply furrowed, and the grain of the timber is very delicately marked, but it is used mostly for sleepers, girders, bridges, and wharf construction.

Euc. siderophloia (iron bark), the Broad-leaved Ironbark or Australian White Ironbark, grows up to 120 feet in New South Wales and Queensland. It has dark-red timber with strongly-marked grain, and is very suitable for work in which great strength and durability are required.

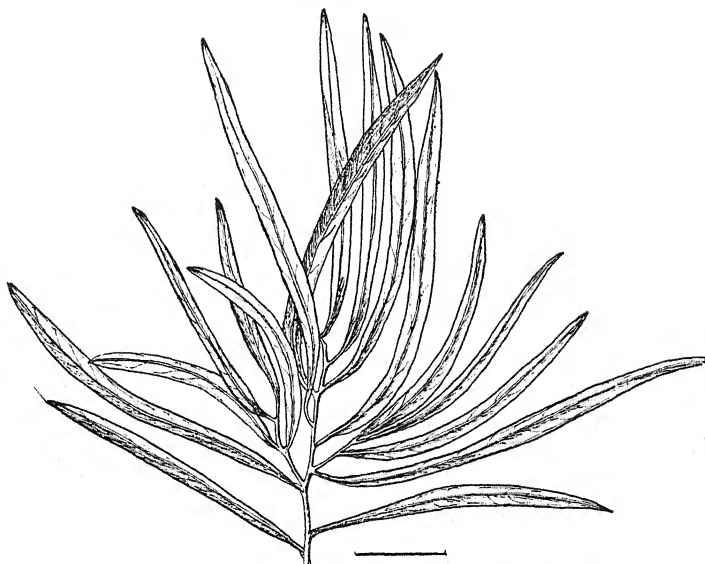


Euc. Sideroxylon
(Buds and
Flowers)

Euc. Sideroxylon (iron wood): A Red Ironbark known popularly by its aboriginal name of "Mulga" and called Black Ironbark sometimes—a slow and irregular growing tree, but occasionally reaching 100 feet in height. It has very pale, glaucous leaves, about 6 inches long and pale-pink flowers and is found in all the States but Tasmania and Western Australia. It is one of the hardiest of the Eucalypts, resisting frost, drought and heat, and its timber is of a deep-red colour, hard, strong, durable and suited for heavy work.

Euc. paniculata (flowers in panicles) is the king of the Ironbarks, growing in the middle coastal districts of Victoria, New South Wales and to Northern Queensland, reaching 150 feet in height, with a gray, deeply-furrowed, corky bark but the inner portion of which is almost as close as the wood. Its timber has a strongly-marked grain and is of great strength and durability, and weighs 64 lb.; the colour ranges from the palest gray to chocolate, darkening on exposure. It is planted extensively in South Africa, mainly for use as railway sleepers.

Euc. drepanophylla (sickle-shaped leaves), an Ironbark indigenous to Queensland and Northern Australia, is a small tree closely allied to *Euc. crebra* but differing chiefly in having larger flowers and more globular fruit. The leaves are lanceolate, but usually falcate, acuminate, about 6 inches long, the flowers three to six in umbels, usually three or four together in short axillary or terminal panicles, the fruit sub-globose, truncate, about four lines diameter, slightly contracted at the orifice, the rim rather thin, the capsule somewhat sunk, but convex, so that the valves often slightly protrude.



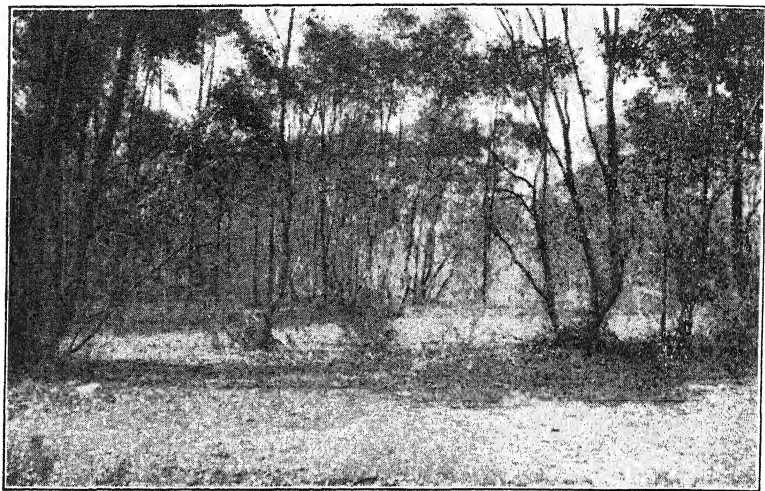
Eucalyptus viridis (Green Mallee)

THE MALLEES

The Mallees are dwarf gum-trees, generally with a large, knobby root-stock which sends up a number of relatively thin stems. Usually Mallees grow on somewhat level land, avoiding river flats and preferring soils which are sandy or dry. At times a Mallee may grow into a single-stemmed tree of medium size, and they include several species.

Clumps of Mallees are very useful in providing breakwinds and shelter-belts. They also furnish fuel in their roots and a certain amount of suitable timber of small size, and some of the species yield valuable oil.

Euc. viridis (green, native to Victoria and New South Wales, and known as Green Mallee, Red Mallee, Brown Mallee, is a small tree 20 feet in height with smooth bark, yellowish on the underside. The leaves are narrow-lanceolate about 3 or 4 inches long, bright green in colour, the small flowers are in clusters of seven to ten, on axillary peduncles, the fruit round, about two to three lines in diameter. The timber is yellowish, hard, close-grained, but usually too small to be of economic value. The roots are excellent for firewood. This tree was called by Cunningham *acaciaformis* because of its acacia-like thin leaves.

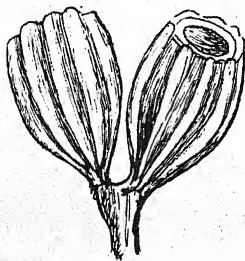


Victorian Forestry Commission, photo.

Mallee Scrub (*Eucalyptus dumosa*)

Euc. dumosa (bushy): A small tree with smooth, white bark, known as Bull Mallee, and native to Victoria, New South Wales and South Australia. The leaves are lanceolate, 3 inches long, the sparse flowers are on axillary peduncles, the fruit oblong. It yields a valuable oil.

Euc. oleosa (oily): A small tree, known as Red Oil Mallee, native to Victoria, South Australia, New South Wales, Queensland and Western Australia, occasionally reaching a height of 30 feet with remarkably thin bark, and leaves narrow-lanceolate 4 to 6 inches long, flowers 6 to 11 on axillary peduncles, fruit globular. The timber is reddish, close-grained, hard and interlocked.



Euc. incrassata

Euc. incrassata (thickened): A small tree 20 to 30 feet high, native to Victoria, New South Wales, South Australia and Western Australia, and known as Yellow Mallee. It has a smooth bark and flowers in groups of three to eight on short stalklets and fruit ovoid-cylindrical $\frac{1}{2}$ to 1 inch long and ribbed. The timber is too small to be of economic value, but large root-stocks make good charcoal.

Euc. gracilis (graceful), known as Slender Mallee and native to Victoria, New South Wales, Queensland and South Australia, is a small tree with smooth bark, having several stems from the same root. The leaves are lanceolate, generally with a re-curved point, about 4 inches long and $\frac{1}{4}$ inch wide. The flowers are up to six in the umbel on axillary peduncles, the fruit oblong, 3 inches long, and the timber is useful for fuel.



Euc. Luehmanniana

Euc. Luehmanniana (after J. G. Luehmann): Endemic to New South Wales but recorded only from National Park and Bulli Mountain, a small tree with flaky bark round the butt of the trunk, and smooth upper limbs. The leaves are variable in size from lanceolate to broadly lanceolate, about 6 inches long and 1 inch wide, green on both sides. The ribbed fruit is hemispherical and six lines in diameter.

Euc. uncinata (hooked), is known as Hooked Mallee, and native to Victoria, New South Wales, South Australia and Western Australia. It is a small tree with smooth, ash-gray or almost white bark. The leaves are lanceolate about 3 inches long, thick, usually with curved, hook-like tips, and under $\frac{1}{4}$ inch broad, the flowers small, white, six to eight on short axillary peduncles, in terminal panicles, and the fruit pear-shaped. Its timber is brown or somewhat reddish, but too small to be of value. The tree usually grows on dry sand-hills, and is useful in checking wind-erosion.

These are but few necessarily of the many Eucalypts, described for special reasons, chiefly on account of their economic value and decorative qualities.

EUCALYPT CAPSULES

The seed-capsules of Eucalypts gradually form a firm, tough covering which endures much weathering and usually remains on the trees for a considerable time. The seed-capsules of the different species vary in size from one-eighth of an inch to an inch or more in diameter. The shapes are various, the prevailing forms being that of a cup, a top, or an egg. As the seed-capsules mature the operculum drops off, exposing the valves, and the seeds fall out between them. The shape of

the seed-capsule and the position of the valves—peculiar to each species—supply data for determining the name of a Eucalypt. The seeds are, in most species, very small and numerous, but in some, such as *Euc. ficifolia* and *Euc. calophylla*, they are as much as an inch long and narrow, in the former case winged but not in the latter. This difference is, in the red-flowering *Euc. calophylla*, the only means of positively identifying the two species. The number of young plants that the seeds of a single tree could produce per flowering season is enormous. The Eucalypts usually bloom so freely and so early in their growth that they are an important source of nectar for bees. As some species are found in bloom at any season, and often during droughts when other blossoms are scarce, they furnish a constant supply of bee-food. When planting Eucalypt trees for forest-cover, wind-breaks, shade, timber, or fuel, it would be advisable, where the bee industry is important, to select species known as good producers of honey.

PROPAGATION OF EUCALYPT SEEDS

The best method of starting Eucalypts is to sow the seed in shallow boxes in prepared soil. A mixture of coarse sand and leaf-mould (two parts of mould to one of sand) is the best. This is put in shallow boxes; the seed is shaken quite thickly over the surface; a light covering of sand is placed on top, and the surface is kept constantly moist. The young plants generally appear in a week or so. After their germination the soil should be kept moist but not wet. If kept too damp the young plants will be attacked by a parasitic fungus and perish. Applying the water in the forenoon, so that the soil and plants have time to become partially dry before night, is a helpful precaution in preventing fungi. Leaving the seed-boxes out during a light rain will often start seed that artificial watering for weeks has failed to bring up, and young plants are very much refreshed and invigorated by a shower of rain. When the young seedlings are 2 or 3 inches in height, they should be transplanted into beds of fresh soil and planted about 2 inches apart each way. When the seedlings are from 4 to 8 inches high they are ready for planting out. When planting Eucalypts for timber or fuel it is advisable to set them 12 to 16 feet apart each way in solid blocks. When set in this way they grow straighter (thus making them more serviceable for timber, split more readily for fuel, and are more useful than if they grew isolated and exposed to winds.



N.S.W. Government Printer, photo.

Angophora cordifolia (Heart-leaf Gum Myrtle)

ANGOPHORA

Closely allied to the Eucalypts, in fact with difficulty distinguished from them (because they all have the same characteristics of form, except the lid protecting the bud) are the *Angophoras*, considered by some scientists as the original, ancestral genus of the Eucalyptus family. The name is derived from the Greek words "angos," vessel, and "phora," to bear, from the goblet-like seed-vessels. *Angophoras* are called Native Apple Trees or White Apple, being so named by early settlers on account of a fancied resemblance. There are five species, native to the Eastern States.

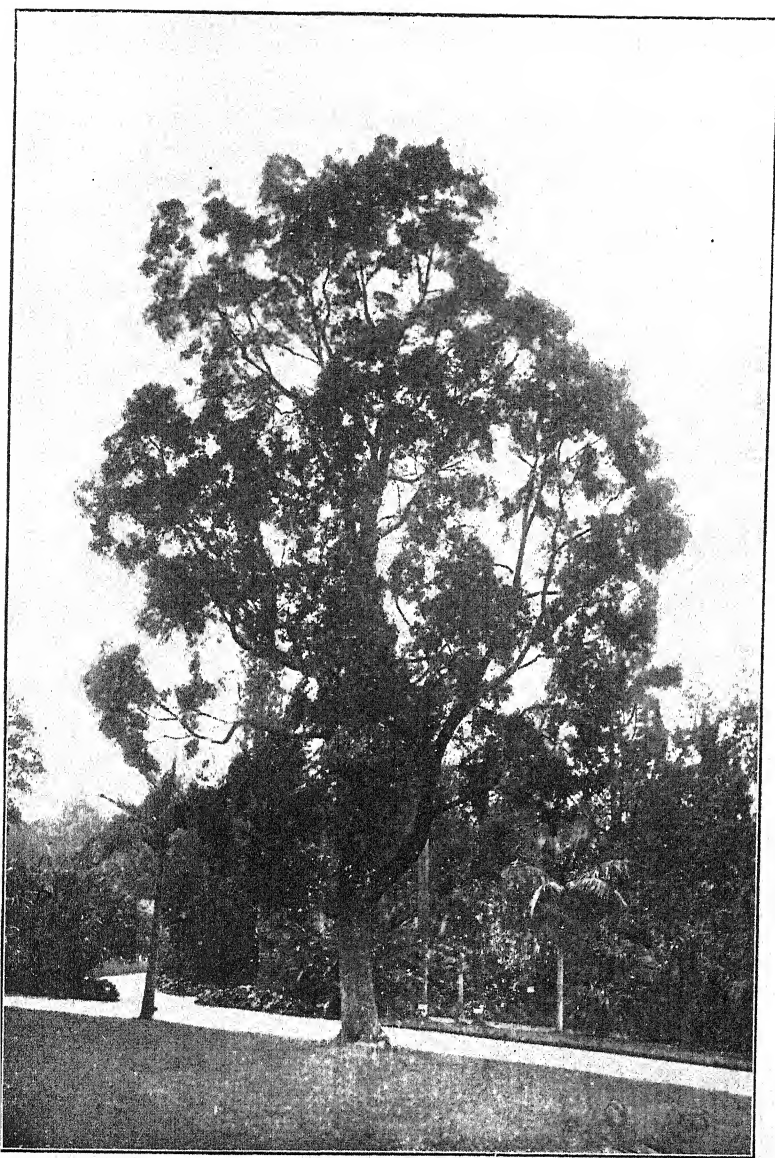
Angophora lanceolata (tapering at each end): A tree of considerable size, known as Mountain Apple Tree, native to New South Wales and Queensland, 70 to 80 feet high, with a diameter of 24 to 36 inches, the bark deciduous in large smooth flakes as in *A. cordifolia*. The branches and foliage are glabrous and scarcely glaucous, the leaves petiolate, lanceolate, acuminate, 3 to 5 inches long, tough, with numerous fine parallel veins, the flowers in dense terminal corymbs or short panicles, larger and more dense than in *A. intermedia*, the fruiting calyx thick and smooth. The timber is strong, heavy, subject to gum veins and used for naves of wheels, slabs, rough buildings and fuel.

Angophora subvelutina (somewhat velvety), known as Velvet Gum Myrtle, is probably only a variety of *A. intermedia*—a fair-sized tree with rough persistent bark, the leaves ovate to lanceolate 2 to 4 inches long, the veins numerous but not so fine as in *A. intermedia*, the flowers small, in loose corymbs, the fruiting calyxes 3 to 4 lines in diameter. The timber is heavy and tough, soft while green but very hard when dry; it is used for posts and rails, wheel naves, bullock yokes, handles, etc.; its weight 52 lb. per cubic foot.

Angophora Woodsiana (surname Woods): A tree endemic to Queensland, known as Apple Tree, with a large spreading head and persistent bark, often containing quantities of liquid red gum in hollows of the trunk. Its leaves are thick, broad, and 4 to 7 inches long, the timber hard and heavy of a pinkish tint, but of little value. The tree yields a brittle, reddish kino, used as a remedy in diarrhœa.

Angophora cordifolia (leaves heart-shaped), known as Heart-leaf Gum Myrtle and native to New South Wales, is a small tree, with a smooth bark which falls off in large flakes. The glabrous leaves are sessile, ovate, cordate at the base, 2 to 4 inches long, smooth above and hairy underneath, the large yellowish flowers are 4 to 6 inch each umbel, forming a dense terminal corymb, the fruiting-calyx very hard, about $\frac{3}{4}$ inch broad at the top, and as much in length. Wood of a pinkish colour, hard and heavy, but not a durable timber.

Angophora intermedia (intermediate), known as Apple-tree, Spurious Apple-tree, Gum Myrtle, "Bu-poo" and "Nankoor," and native to Victoria, New South Wales and Queensland, a tree slightly taller than *Angophora lanceolata*, with rough persistent bark, quite glabrous or slightly hairy. It has long and narrow leaves, 2 to 4 inches long, oblong to lanceolate, the flowers are rather small, in loose corymbs or panicles, the fruiting calyx three to four lines in diameter at the top and about as long. The timber is pale and fairly hard, strong and heavy, polishes well, and can be used for cabinet-work, but liable to be attacked by borer insects. This is one of the best of the Angophoras, often attaining a height of 130 feet, and growing with the rapidity of a Eucalyptus, but being more close and shady in its foliage. It would be a good tree for lining public roads and for sheltering plantations. A single tree of this species or of *Angophora lanceolata* will yield as much as two gallons of liquid kino at a time; nearly half of this consists of kino-tannic acid; fishermen use it to tan their nets. The flowers of this and all Angophoras are much frequented by the honey-bee.



W. R. Guilfoyle, photo.

Angophora lanceolata (Australian Apple Myrtle)



Acacia dealbata (Silver Wattle)

ACACIA

*"Lightly the breath of the Spring wind blows
Though laden with faint perfume;
'Tis the fragrance rare that the bushman knows.
The scent of the wattle bloom."*

—Gordon.

The second most popular and distinctly Australian tree is the genus *ACACIA*, chiefly on account of its lovely and profuse golden blossoms, for it is of less importance than the noble *Eucalyptus* from every standpoint, though some *Acacia* trees are handsome in shape, not inconsiderable in size and furnish excellent wood. The name, *Acacia*, is somewhat misleading as far as its real applicability is concerned. It is derived from the Greek *Akazo* which means "I sharpen," in allusion to the spines of the thorny bushes or small trees called also *Mimosas*, which are known as *Acacias* in Africa, Asia and America, and are the *Acacias* of commerce.

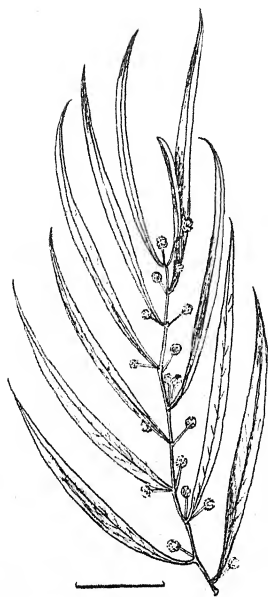
In no other part of the world but Australia are *Acacias* such an important and luxuriant part of the natural vegetation, growing universally over the whole continent and Tasmania, regardless of soil or temperature. They are very numerous in some districts and form a dominating feature of the landscape, especially in the Springtime. Though not usually having a very robust appearance, *Acacia* trees are exceedingly hardy, as they prefer to grow under the severest natural conditions than in cultivated places. They are not generally very long-lived, as are the *Eucalypts*. *Acacias* are grown in abundance in other countries, flourishing in the warmer climates of Africa, Egypt and California, but despite their hardiness in Australia they

can only be grown in greenhouses or indoors in colder climates such as England, where they make charming pot plants, for which purpose *Acacia verticillata* is favoured.

The Acacias are known by many popular names, the principal one applying to the whole genus being "Wattle." It is said that the name originated from the practice of the aborigines in making a kind of wicker-work from pliable saplings for their shelters, as observed when white men first landed on Australian shores. The first time this was referred to in an Australian book was in the first Governor's (Phillip) "Voyages," but the saplings used then were the Native Beech (*Callicoma*) which was known at that time as "Black Wattle" because of its fluffy yellow flowers, but it is not an Acacia. The earliest settlers, however, found the Acacia saplings very suitable, owing to their toughness and pliability, for making their "wattle-and-daub" (thin wood frames covered with mud or clay) huts—an old English and Northern Europe building system among poor people.

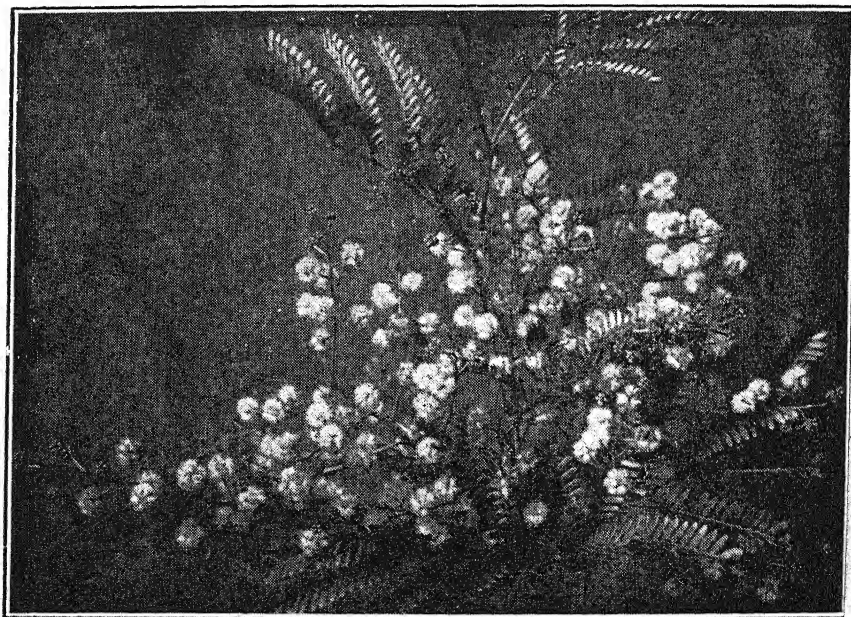
As time went on the settlers became acquainted with many of the vast number of different species of Acacia native to Australia, and adopted the names given to them by the aborigines, such as Myall, Mulga, Boree, Brigalow, Miljee, Windi, Cooba, Gidgee, Eumung, Yarram, or gave them the descriptive English names of Blackwood, Lightwood, Spearwood, Black-apple, Needle-brush, Hickory, Umbrella-bush, Kangaroo-thorn, or such distinguishing adjectives as silver, golden, black, green, weeping, prickly, narrow-leaved, broad-leaved, feathery, etc., also the merely slang terms of "Sally," "Wait-a-while," and even that of "Dead-finish," given to an insignificant low bush of the interior, which was found impenetrable by early travellers, "Wait-a-while" being used for a similar reason.

The many species are extremely variable in size and in the structure of their leaves and, to a lesser extent, the colour of their blooms. Some are small and almost hidden in the grass, being little more than trailers, and others are large forest trees. Some have true leaves that are twice or thrice pinnated (feathered), with a multitude of small leaflets; others have no leaves properly so called but in their stead the leaf-stalks, or phyllodes enlarge and assume the appearance and doubtless the functions of true leaves; in the case of the Blackwood, both true and phyllodineous leaves appear on the same seedling, and of Golden Wattle, where the true leaves are only seen in the early stages of the seedling, the mature leaves being only phyllodes.) A few others develop such small phyllodes that they are only spines or prickles. Some of the leaves are dark bronze-green in colour, others bright-green or silvery-gray. The more plentiful and better known of the pinnate-leaved are *Acacia dealbata*, *Ac. botrycephala*, *Ac. decurrens* and *Ac. terminalis*... Of the phyllo-

*Acacia verniciflua.*

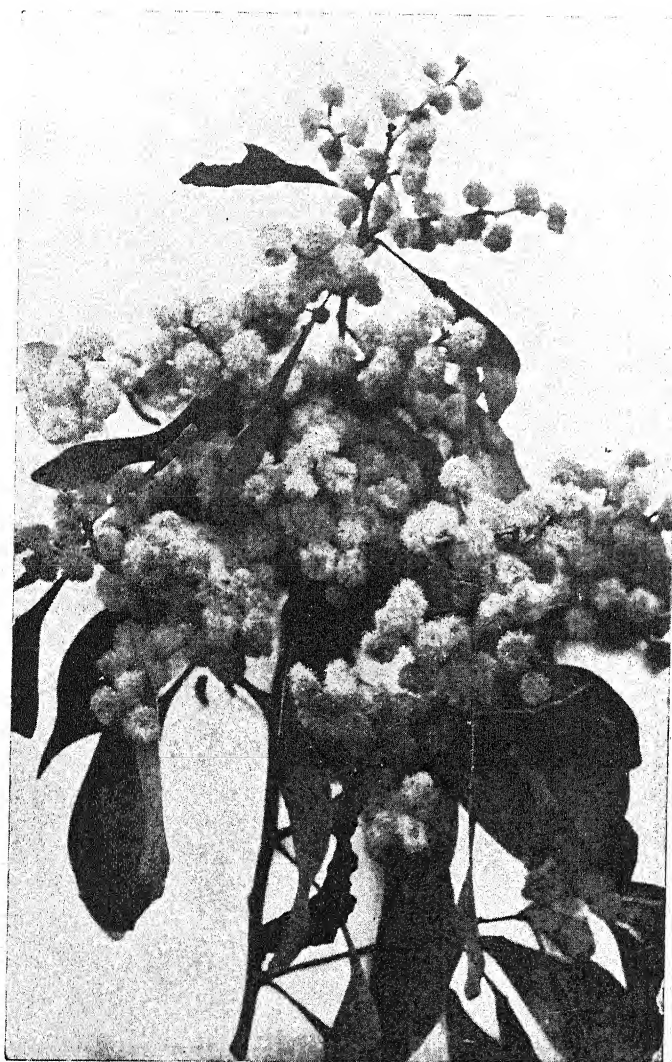
dineous sections are *Ac. myrtifolia*, *Ac. pycnantha*, *Ac. longifolia*, *Ac. prominens*, *Ac. glaucescens*, *Ac. linearis*, *Ac. implexa*, *Ac. leprosa*, *Ac. melanoxylon*, *Ac. pravissima*, *Ac. vestita*, *Ac. podalyrifolia*, *Ac. verniciflua* and others.

The blossoms may be divided into two large groups; one in which they consist of little fluffy balls grouped together into tufts or racemes, and the other in which they form short rods or spikes of bloom, some being abundant and others sparse. By examining the flower when it is perfectly full, through a magnifying glass of even average power, it will be seen that each floret is in itself perfect in form; each has a large number of stamens in its small compass, numbering from as low as ten up to two hundred. Their colour is yellow of various shades in the different species, ranging from the palest yellow to copper. Their perfume



F. E. Pescott, photo.

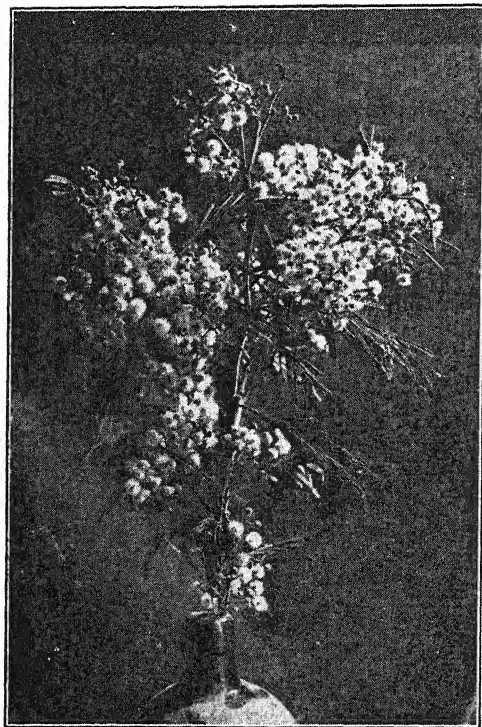
Acacia discolor (Sunshine Wattle)



Acacia pycnantha (Golden Wattle)

is exquisitely delicate and fresh, and efforts have been made in Australia to capture it by distillation for use as scent, but so far that seems impossible, as it is extremely volatile.

The leaves of several species contain animal food—chiefly starch and gum, and in dry seasons are used as fodder for stock.

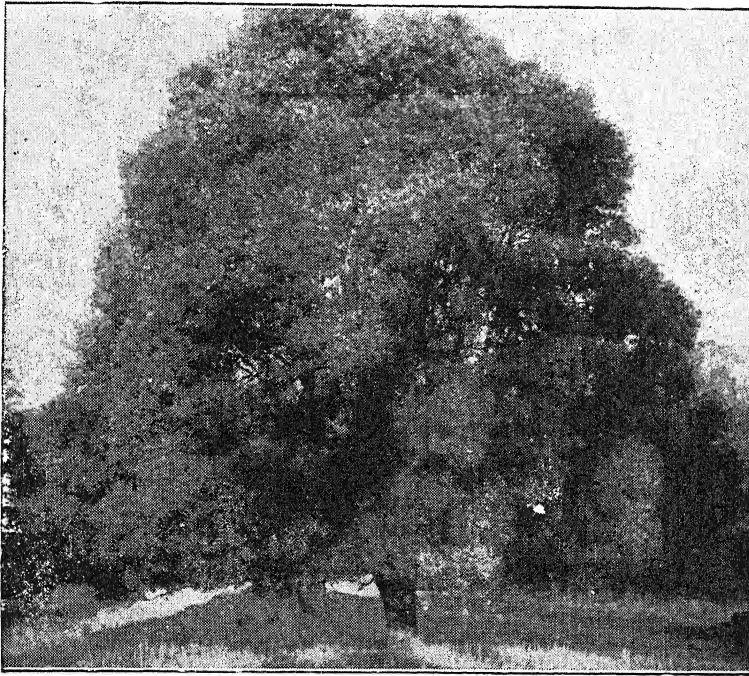


Acacia dealbata

Those of Mulga are much favoured by camels and have a medicinal value for horses and cattle; tubercular disease is said to be unknown among sheep in country where Boree grows, such as the Riverina, and Brigalow or Spearwood is also a forage plant. The bark of the Acacias is more or less astringent, and is used in domestic medicine to make decoctions or infusions used in a number of ailments, but its chief and most extensive use is for tanning leathers, etc. For tanning purposes it is stripped from mature trees during September to December, when the bark is easily removed, and stacked in bundles.

Trees growing on limestone formations produce very inferior tannin to that of trees grown on any other formation. Oak and Hemlock barks, which are largely used for tanning in Europe and America, average about 15 per cent. of tannin, while Black Wattle, *Ac. decurrens*, contains from 30 to 35 per cent. *Acacia decurrens* var. *normalis* is the well-known Black wattle or Sydney Tan or Green Wattle, considered by tanners to contain in a ton of bark sufficient to tan 25 to 30 hides, and very suitable for sole-leather and other heavy goods. A supply of tannin bark is obtained from the Golden Wattle (*Ac. pycnantha*); but that of the Silver Wattle (*Ac. dealbata*) is inferior.

(A large number of Acacias yield gum in greater or lesser quantities, which is used for adhesive purposes, cotton printing,



Development and Migration Commission, photo.

A Blackwood Tree, with a spread of 61 Feet
(*Acacia melanoxylon*)

etc., and in veterinary practice it is used for wounds and sore shoulders on horses. The Acacia is not of much value as a honey plant but supplies pollen for bees, which is used in the construction of their honey-combs. The timber of Acacia trees is in some cases very valuable, though usually small; it varies in colour from light, as in *Ac. Maideni*, to almost black as in *Ac. pendula* (a myall), the other darkest coloured being that of *Ac. acuminata*, the Raspberry-scented Acacia. The red hardwoods are Mountain Hickory (*Ac. penninervis*), the Willow-leaved Acacia (*Ac. salicina*), and Hickory (*Ac. Bakerii*) which is used for railway-carriage work.

Acacia melanoxylon (blackwood): The Blackwood is considered the best of all Australian Acacias for furniture, panelling and cabinet-work (closely approaching the far-famed Italian Walnut), and for parts of organs and pianos, also for fencing, bridge and boat building. Occasionally the wood, which usually has a handsome oak-like, straight grain, is prettily figured, and is then cut fine and used for veneers, having in fact

the most unique and beautiful figure of any timber, plaid-like, with paler lines superimposed across flaky, red markings. This tree grows widely in Queensland, New South Wales, Victoria and Tasmania, and is probably the giant of the Acacias, as it attains a height of 80 to 100 feet with a good diameter. The best trees grow on hilly ground, but the longest-living on lower or damper levels. It has hard, rough, furrowed, compact bark, and the leaves, which are really only phyllodes, are straight, lanceolate, and up to 6 inches in length, the pale, delicately-coloured flowers clustering fifty in a single head. It is liable to the parasite mistletoe (*Loranthus pendulus*), which destroys many of the trees affected. The timber is known as Blackwood on account of its dark colour, but it is by no means black, and not even a very dark brown; and it is also known as Lightwood because it is light in weight.

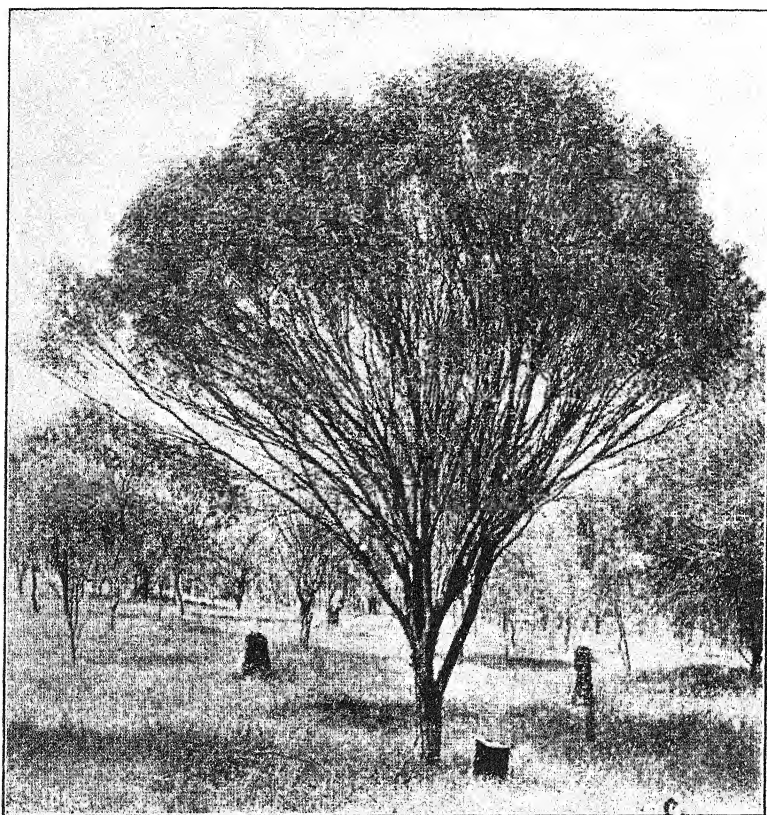
Ac. acuminata (tapering): An interesting wattle, popularly called Raspberry-Jam Tree or Jamwood, or simply Jam, on account of the heavy raspberry-like scent of its wood when cut. Growing to 20, 30 or even 40 feet high, it is native to Western Australia, where it was plentiful on the wheat belt, and regarded by farmers as an indication of good wheat and sheep country, but is being rapidly cut out. It has gray, fissured, rough, fibrous and persistent bark, and timber of a rich reddish-brown colour, dense, hard and tough, and resistant to the borer, probably on account of its scent. It has a nice grain, polishes well, and is used chiefly for cabinet-work and small ornaments, also tobacco pipes, etc.; it is much used for making charcoal, and wonderfully durable fence-posts made of it are still sound in the ground after upwards of seventy years.

Ac. glaucescens (bluish-gray), known as Mountain Brigalow or Coast Myall, has close-grained, dark-coloured, prettily marked and faintly scented timber, which is heavy (62 lb. per cubic foot), very hard and durable, used for cabinet-work and likened to English Walnut and Rosewood. It also provides a gum which makes an excellent, adhesive mucilage, and is one of the loveliest of all Wattles, often tall and yet wide-spreading, and reaches 30 to 45 feet in height. It grows in the Eastern States, its habitat being well up in the coastal ranges from the south of New South Wales into the south of Queensland.

Ac. aneura (wanting nerves), known as "Mulga" and so called popularly after the narrow shield the aborigines made from its wood, grows to 70 or 80 feet in all the States but Tasmania, and has an exceedingly hard, dark-brown timber which makes excellent fencing-posts and is also used for bullock-yokes. Small galls known as "Mulga apples" occur, not very abundantly, on trees of this species in western New South Wales. These galls are succulent and edible, and welcome to thirsty

travellers. The phyllodes, which are eaten by stock, are rigid, grayish, and minutely hairy, the flower-spikes rather dense and short, but the bark is not of much value.

Ac. armata (armed), the Prickly-leaved or Hedge Acacia known as Kangaroo Thorn, grows to 20 feet and is found



Australian Forestry Journal, photo.

Acacia acuminata (Raspberry-jam Tree)

from Queensland to Western Australia, usually rather small, and despite its thorns it is used for hedges and suitable for that purpose; the wood, though small, is sound and durable with a pretty grain.

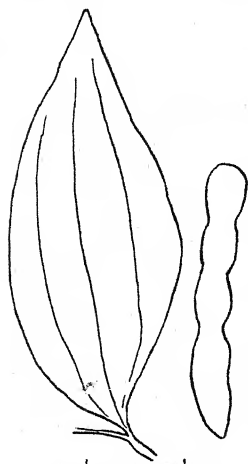
Ac. aulacocarpa (grooved pods), a so-called Hickory, grows in Central and North Queensland; it has a hard dark-red timber, heavy, tough and suitable for cabinet-work.

Ac. binervata (two-nerved): A small tree which grows to 40 feet, with a diameter of about 12 inches, in New South Wales and Queensland. The timber of a pale-pinkish shade is tough and light, and much prized for axe handles and bullock yokes.

Ac. Baileyana (after F. M. Bailey):

*"Its silver stems hold their blossoms of gold,
The loveliest flower of them all."*

The widely-known Cootamundra Wattle, a native of New South Wales, is probably the most popular of all the Wattles, for it is the most extensively planted in private gardens. It is seldom more than a wide-spread shrub of about 10 feet in height, the very small, silvery-blue, feathery leaves being almost hidden in the late winter with masses of small, yellow, very fluffy flowers. It will thrive under widely different conditions climatically, but prefers good soil and a fair rainfall. It has been known to grow to 24 feet high with a spread of 38 feet in diameter, and a trunk diameter of over 12 inches. It may be pruned immediately after flowering to give it symmetry.

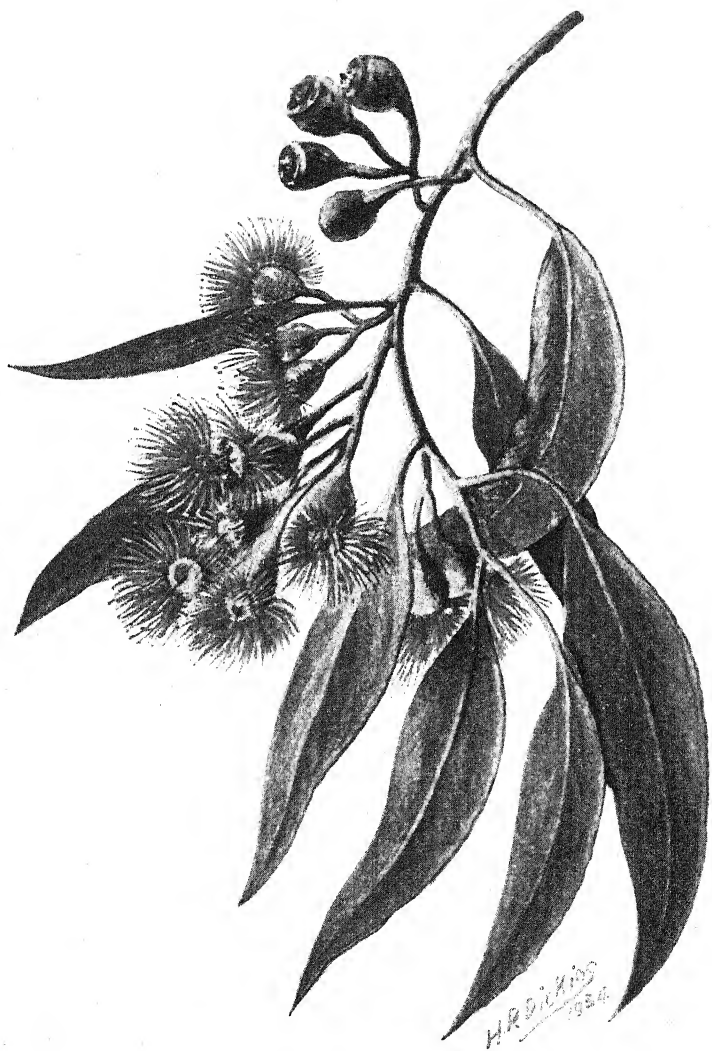


Acacia Bakerii.

Ac. Bakerii (after R. T. Baker):

This species belongs to the central districts of New South Wales and Southern Queensland, and is found at elevations of 1000 feet, but does well also in moist and deep soil; it has been known to reach a height of 200 feet, and is the largest of the Acacias, with a diameter of 2 to 4 feet. It yields a very adhesive, bright and transparent, dark-amber gum of commercial value, and its timber—resembling Australian Teak rather than Acacia—is hard, strong, fairly heavy (54 lb.), and paler-coloured than any other Acacia. It has a handsome grain and is useful for furniture, coach-building, turnery and decorative purposes, but it has a large proportion of sapwood.

Ac. Cambagei (after R. H. Cambage), occurs in the interior of New South Wales and Queensland, known widely as "Gidgee" or "Gidgea," an aboriginal name, and is a medium-sized tree with drooping branchlets, and pale sea-green (glaucous) leaves up to 5 inches long. Its timber is very dark-coloured with a ruddy glow, exceedingly heavy (84 lb. to the cubic foot) and close-grained, rather interlocked, tough, very strong and durable, and has a prettily ringed figure which makes it prized for cabinet-work, and it has been made into attractive

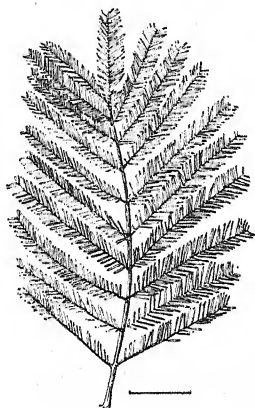


Eucalyptus Sideroxylon
(Red Ironbark)

walking-sticks; owing to its durability it is sometimes used for fence posts.

Ac. dealbata (white-powdered): One of the best known of the Wattles, its popular name being Silver Wattle, from the silvery appearance of its feathery foliage, and it may be considered a typical tree of the whole genus. The flowers are abundant in Springtime, and the tree, 30 to 100 feet high according to situation, is plentiful in Eastern Australia, also South Australia and Tasmania.

Ac. decurrens (petioles decurrent upon the branches) is a handsome tree with two varieties—*normalis* and *mollissima*.



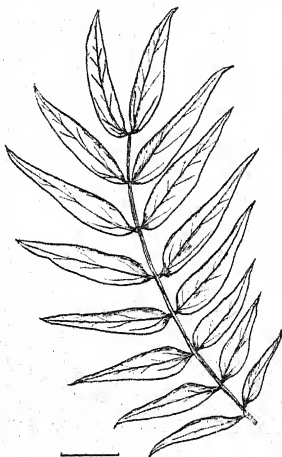
Acacia decurrens var. *normalis*

Ac. decurrens, var. *normalis* the normal species of *Ac. decurrens*, is a beautiful tree of strong, upright growth with fern or feather-like foliage, and very crowded panicles of fluffy, golden flowers. It is native to New South Wales, where it is called King, Green, or Queen Wattle, and has been planted successfully in Victoria. It is useful for its bark.

Ac. decurrens, var. *mollissima* is known as the Black or Tan Wattle of Victoria. The feathery foliage is darker than that of *normalis* and the general appearance of the trunk is black. It is very liable to the attack of insects, and is not usually a durable tree and inferior in appearance to the other variety.

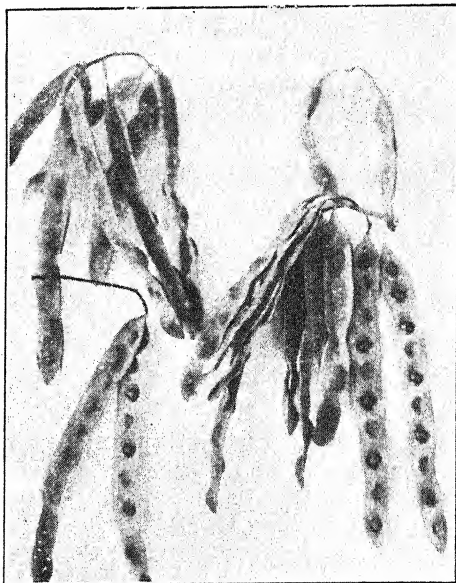
Ac. botryocephala (clustered head): The Sunshine Wattle of East Gippsland, Victoria, a small tree of 10 to 20 feet high, which also grows in New South Wales and Tasmania, with very large, pinnate leaves and large, scattered flower-clusters.

Ac. terminalis (growing at the end of a branch): This tree in New South Wales is called Cedar Wattle and is a decorative tree with fine, dark, feathery foliage—the young leaves very golden and the mature leaves dark green—each leaf consisting of numerous lanceolate opposite leaflets, and large trusses of pale lemon blossoms; it may be recommended for cultivation in parks and large gardens. It grows to 60 or 80 feet and is a well-shaped tree. It used to be known as *Acacia elata* (tall).



Acacia terminalis

Ac. Cunninghamii (after Alan Cunningham): A small tree of 10 to 20 feet, growing in Central Queensland and New South Wales, called Black Wattle and Bastard Myall; it has a dark timber much like Red Cedar but heavier, close-grained, polishes well and is useful for cabinet-work.



F. Chapman, photo.

Seed Pods of *Acacia terminalis*

Ac. doratoxylon (spearwood) is a Brigalow known as Spearwood because it is used by the aborigines for spear-making. It usually grows 10 to 15 feet, but occasionally to 35, found all over Australia except Tasmania, and recognised as one of the most useful timbers, being hard, tough, heavy, durable and close-grained; it is used for gates, buggy-poles and furniture.

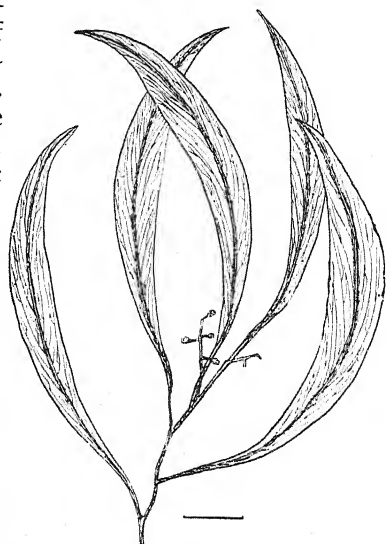
Ac. Farnesiana (the Farnesian Acacia): A small tree growing thickly in the interior to which the nickname of "dead-finish" was given in early pioneering days and might be called the cosmopolitan wattle, for it has the unique distinction of being the only Australian Acacia now common to the new and old worlds, and it is found more or less near the habitats of all Acacias. So far as is known it is considered to be the original Acacia, from which the various species of the world arose. It is the earliest known representative of the bi-pinnated



Acacia longifolia (Long-leaved Golden Wattle)

Acacias, and is thought by some authorities to be indigenous to Africa. In Australia it is distributed over North Australia, Queensland, and the interior of New South Wales towards Cooper's Creek.

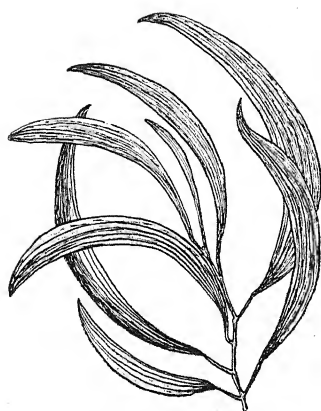
Ac. falcata (boomerang-formed) is a small tree of Southern Queensland and Northern New South Wales, known as "Burra" by the aborigines, who use its bark, which contains much tannic acid, to stupify fish by throwing it in the water, and also as an embrocation for cuts and diseases. It grows rapidly on drift-sand to 20 or 30 feet with a 12-inch diameter. The phyllodes are long, curved and grayish-green. The wood is hard—the outside being yellow and the heartwood light-brown—heavy, tough, and much prized for stockwhip handles, and may be bent into acute curves for coachbuilding.



Acacia falcata

Ac. homalophylla (smooth-leaved): A small tree growing from 15 to 40 feet high in the interior of South Australia, New South Wales, Northern Victoria, and Queensland, also on the barren heaths from the Lachlan River to the Barrier Range. It has pale or glaucous phyllodes, narrowed at both ends, flowers in clusters on slender stalks under an inch long, and a hard, compact, furrowed bark. It yields copiously a remarkably light and clear gum through the summer, resembling ordinary pine-resin, freely soluble and very adhesive. The wood is dark-brown, hard and heavy, and much used for turners' work on account of its solidity and fragrance, especially useful for tobacco-pipes and well adapted for cabinet-making and fancy articles. A strange property of this tree is that when in flower its smell is odious and just before rain almost unbearable.

Ac. longifolia (long leaf): This tree, known as Coast Wattle or Long-leaf Golden Wattle, produces its flowers in long cylindrical spikes instead of the globular heads, and is very popular in its several varieties, which vary considerably in the form of their phyllodes. It grows 15 to 30 feet and in all States but Western Australia.

*Acacia implexa*

Ac. implexa (folded): A native of Eastern Australia known as Lightwood Tree and as Twisted Acacia, growing to 30 feet, with pale-yellow flowers and lanceolate phyllodes often conspicuously curved and very rough bark, its wood very similar to that of the Blackwood.

Ac. leprosa (from its leprous odour), the Leper Acacia, or Scurfy Wattle, also called Native Hickory, is a very decorative tree, 15 to 30 feet high, growing in sheltered gullies in New South Wales and Victoria, with light

pendulous branches covered in the Spring with rich masses of racemes of lemon-yellow flowers.

Ac. macradenia (large-glanded) is a Myall, a native of Queensland, where its height is usually 10 to 12 feet, but occasionally it is a tree 30 to 50 feet high with a 12-inch diameter. Its timber is close-grained, hard and blackish, and takes a high polish. It is a native of New South Wales, with linear leaves and many fine decorative qualities.

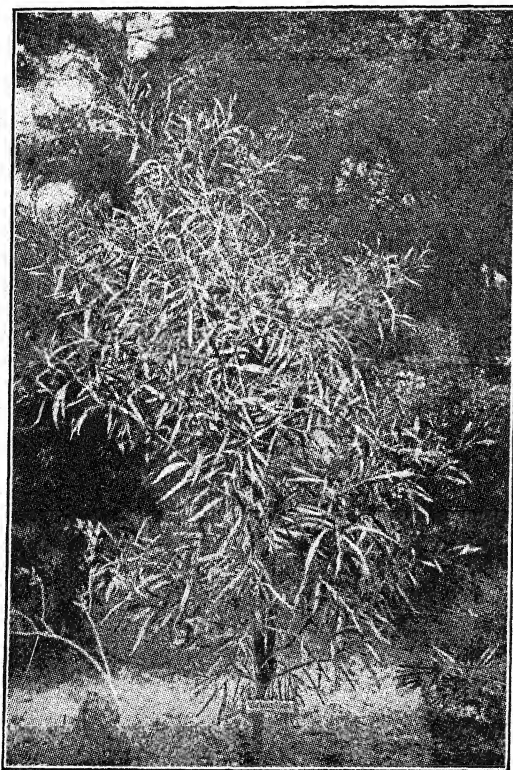
Ac. pendula (drooping branches), Weeping Myall, called "Boree" from its aboriginal name, is a slender graceful and willow-like tree, growing in New South Wales and Queensland to 30 or 40 feet, thriving on river banks and in moist places. Its leaves are useful as fodder for stock, and its hard (it is one of the hardest and heaviest—72 lb.—of Acacia woods) close-grained and tough, small timber is beautifully marked and of a rich dark colour, with a violet-like perfume. It is suitable for cabinet-work and, as it turns and polishes well, is used for making fancy boxes and tobacco-pipes.

Ac. penninervis (feather-nerved), the Mountain Hickory or Blackwood of Queensland, New South Wales, Victoria and Tasmania, is 30 to 40 feet high, its bark—like that of *Ac. mollissima* and some other Acacias—is considered suitable for pulping for paper-making, and is excellent tanning bark, giving 34 per cent of tannic acid.

Ac. prominens (prominent gland): A well-known, decorative, small tree of New South Wales and Queensland, with the suitable name of Golden Rain Wattle on account of its profuse flowering; it has shortish, linear phyllodes.

Acacia polybotrya (flowers on many branches) : This tree, native to New South Wales and Queensland, attains a height of 40 feet and yields a useful tanning bark. Its wood is pinkish, close-grained, hard, and beautifully marked—a valuable cabinet timber.

Acacia harpophylla (boomerang-shaped) : This is one of the principal "Brigalows" on the scrubs of Southern Queensland and sometimes attains a height of 80 feet. It supplies a considerable amount of wattle-bark for tanning purposes, especially for light leathers. The timber is brown, hard, heavy and durable, splits freely, and is well adapted for fancy lathe work. It yields a large amount of gum which is soluble in cold water, forming a mucilage as useful as Arabic Gum.



(Golden Wreath Wattle)

Acacia saligna

Ac. saligna (drooping), is known as Golden Wreath Wattle, and is 15 to 30 feet high, a native of Western Australia, but planted successfully elsewhere and a favourite in gardens. The leaves are long and pendulous and the rich coppery-yellow flowers are in long racemes; it also has useful, prettily-grained wood.

Ac. subporosa (somewhat pitted) : A tree growing in Victoria and New South Wales, 40 feet high, with a diameter up to 18 inches. Its exceedingly tough and elastic wood is known as Hickory and is valuable for buggy-shafts, tool-handles, gun-stocks, etc., also for tall straight spars

for masts. Its phyllodes are flaccid and dotted with glandular pores, and the branchlets slender, the flower-headlets hairy.

Ac. Dunnii (after E. J. Dunn): A comparatively newly-discovered and certainly unique and very rare *Acacia* discovered in 1913 by Mr. E. J. Dunn, an Australian geologist, while on a visit to Blunder Bay, North Australia. It was found only at about ten miles up the Victoria River from its mouth. Its



• Large Leaf of Dunn's Wattle (*Acacia Dunnii*)

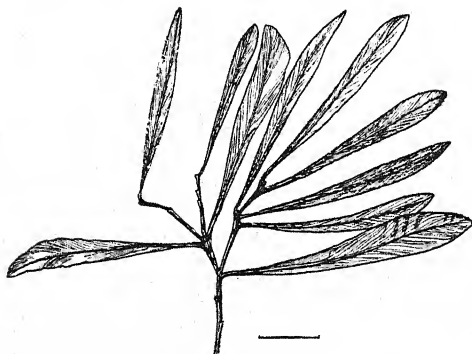
flowers and seed-pods are large and sparse and growing only in a single spray at the top of each shoot. Its most curious character is found in its leaves, the lower ones, shaped like an elephant's ear, being as much as 17 inches long, becoming gradually smaller towards the top of the tree, which is not more than 14 feet high and slender, growing without visible soil in

intensely hard quartzite rock, the roots penetrating the fissures and cracks, evidently content with the nourishment supplied by occasional tropical rains.

As tribute to Mr. Dunn, I quote the following lines:

*"To sit on rocks, to muse o'er flood and fell;
To slowly trace the forest's shady scene,
Where things that own not man's dominion dwell,
And mortal foot has ne'er or rarely been;
To climb the trackless mountain, all unseen,
With the wild flock, that never need a fold;
Alone o'er steep and foaming falls to lean—
This is not solitude: 'tis but to hold
Converse with nature's charms, and view her stories
untold!"*

—Byron.



Acacia retinodes

Ac. retinodes (net-like): Known as "Wirilda", a small tree of Victoria and South Australia, distinctive because it flowers (but not profusely) throughout the year. Its phyllodes are narrow and thin, the fruit much compressed and straight. It makes a useful decorative shrub for gardens.

Ac. salicina (willow-like): Known as "Coobah," its aboriginal name, and also the Willow Acacia from its drooping, thick, straight, dull-green, lanceolate-linear foliage, a very decorative tree with bright flowers and foliage sometimes bluish or glaucous. It is variable in size, but may grow as high as 50 feet, usually frequenting the coastal areas of all the eastern and southern States. The timber is very handsome, and valuable for the finest furniture and cabinet-work; the Queensland aborigines, who call it "Bakka", use it for making boomerangs, it being fairly light in weight (48 lb. per cubic foot).

Acacia excelsa (tall), the Ironwood Wattle, known as Ironwood Acacia and "Tooloo", grows in Queensland and New South Wales. It attains a height of 80 feet and has glabrous drooping branchlets. The timber is dark-coloured and pink towards the centre, hard, heavy, close-grained, and well adapted for furniture—useful where strength and durability are required.

Acacia pravissima (very crooked), known as Ovens Acacia and native to Victoria and New South Wales, is a tall shrub or small tree, with slender angular branchlets; the phyllodes numerous and obliquely obovate or almost rhomboid, recurved, $\frac{1}{2}$ inch long, the lower angle acute, the upper one rounded, the flowers in racemes with ten to twenty small flower heads, each containing eight to twelve flowers, the seed-pod flat.



Acacia cultrifolia

Acacia cultrifolia (knife-like), known as Knife-leaf Acacia, and indigenous to New South Wales, is a tall, bushy shrub or small tree, with slender, angular branchlets, the phyllodes obliquely obovate-lanceolate, sickle-shaped, $\frac{1}{2}$ to 1 inch long, the flowers in racemes consisting often of ten to twenty globular heads, forming a terminal leafy panicle, the pod very flat, 2 to 3 inches long and about three lines broad. An ornamental tree extensively cultivated in parks and gardens.

If one were asked for a selection of Acacias for a small plantation, which would give a variety of high-class specimens and secure a fine blossoming during an extended period, one might say: *Acacia pycnantha*, the Golden Wattle; *Acacia Baileyana*, the Cootamundra

Wattle, for its early profusion of delicate flowers and small, silvery-gray foliage; either *Acacia salicina* or *Acacia saligna* on account of their weeping habit of fine foliage and rich, coppery flowers which follow the season of the Golden Wattle; *Acacia glaucescens* with bright, glaucous leaves and abundant, dense masses of flowers; *Acacia longifolia* of hardy growth with a profusion of spike-shaped blooms; *Acacia decurrens* var *normalis*, a beautiful upright tree with abundant blossoms; *Acacia retinodes*, which blossom nearly all the year round though its flowers are rather pale and not very profuse, and *Acacia podalyriaefolia*, for its bold, silvery foliage and beautiful clusters of golden flowers. These among the trees, and of the shrubs *Acacia acinacea*, a shapely shrub with very abundant flower-masses; *Acacia myrtifolia* with pale, fragrant flowers branching low, and suitable for hedges; *Acacia linearis* of the drooping narrow foliage and spike-flowers; and *Acacia rupicola* for the sake of its different form, bright foliage and fragrant blossoms.

THE CONIFERS

The extensive family of Pines is spread over nearly the whole globe, especially in the Northern Hemisphere but within the tropics chiefly confined to mountainous regions. There are at least twenty different kinds of Conifers or so-called Pines native to Australia but there are no true Australian Pine-trees. They are called Conifers because they have cones for seed-vessels. The name Pine is used too widely to be scientific, though it is not objectionable when used popularly as a simple and convenient common name, as the Conifers are "first cousins" to the Pines.

DACRYDIUM

(*dakydion*, diminutive of darky tear.)

The genus is dispersed over the Indian Archipelago, New Caledonia, and New Zealand; the Tasmanian species is endemic.

Dacrydium Franklinii (a surname): The so-called Huon Pine, or the Teak of Tasmania, is one of the most famous of the Conifers, and grows in Tasmania only, reaching to 100 feet or more, but is slow growing and has small foliage. It is becoming scarce, as it has been much sought by timber-getters, and now is growing only in places difficult of access. It was for many years Tasmania's most distinctive tree and, like the Blackwood, one of its valued assets. It is one of the finest of the few softwoods grown in the Commonwealth, having pale canary-coloured timber, light in weight, but tough and close-grained, with scarcely any figure, more durable than Teak but as easy to work. It seasons, dresses and polishes well, and is especially suited for house-fittings and panelling, also boat-building. The charming marking of its lower butt, roots, etc., make that wood particularly suitable for cabinet-work, and its aroma, being strong, keeps insects away. Such is its durability that it has been buried for forty years and brought up sound though discoloured, its antiseptic oil preserving it from decay.

PHYLLOCLADUS

(Leaf branch)

Besides the Australian species which is endemic, there is one in New Zealand and another in Borneo.

Phyllocladus rhomboidalis (diamond-shaped), the Adventure Bay Pine, is another fine tree of Tasmania, growing in dense forests and near rivers—in protected places or lower levels. It is a slender tree reaching 67 to 70 feet, but dwarfed on the

mountain ranges. It is also called Celery-topped Pine from the appearance of the upper part of its branches, and its timber ranks next to Huon Pine, being pale-coloured, fairly hard, light in weight, easily worked, and has a close short grain. It is suitable for joinery, cabinet-work, railway rolling-stock, and for panels, violins, etc.; also specially valuable for ships' masts and spars.

ATHROTAXIS

(Joint pressure)

The genus is limited to the three Tasmanian species.

Athrotaxis cupressoides (cypress like): A Tasmanian Conifer called King William Pine, a fairly large tree with small, crowded leaves. Its durable timber, which is one of the best softwoods, has a slightly purplish or pinkish-yellow tint and a Cedary scent (hence its specific name). The clearly-marked, even-grained timber resembles that of the Celery-topped Pine, as it is light in weight, planes and polishes well, and is suitable for joinery work not requiring strength, various cabinet-work needing a light shade of colour, rowing-sculls, moulding, and for violins.

Athrotaxis laxifolia (sparsely-leaved) and **Athrotaxis selaginoides** (Selaginella-like) are similar.

CALLITRIS

(Scale-like leaves arranged in threes)

The very well-known Conifer genus known as Cypress Pine. There are about eighteen species, mainly of Australia, but also growing naturally in Africa. Usually these trees are from 60 to 80 feet high, but in Tasmania some have reached to 100 feet with a maximum diameter of two and a half feet. They are of slow growth, but grow quicker there than on the mainland. The genus supplies Australian Sandarach in greater or lesser quantity, these resins being very similar, with a pleasant aromatic odour; when powdered they all make fairly good "pounce" and are an efficient substitute for ordinary Sandarach, used in making varnishes. The timber is a valuable softwood but liable to be knotty. The genus presents a variety of timbers among the different species, but all of them similar in general qualities.

Callitris glauca (sea-green) is commonly known as White Cypress Pine, and in the Riverina, N.S.W., as Murray Pine. No other Callitris has so wide a distribution. It occurs on the western slopes of the coastal ranges of Australia, right across the far interior from east to west and north to south, and is easily distinguished from other species of the genus by

its glaucous or greenish-blue foliage. It varies in height from stunted in the interior to over 100 feet on the Dividing Range. The bark is hard, compact and furrowed, and the wood has a variety of shades, sometimes quite pale, almost white, while more commonly it ranges from a light to a dark chocolate colour. The dark colour is much preferred for interior wall decoration of houses in the far west and looks particularly well when polished or varnished. It also makes handsome picture-frames, mouldings and skirtings as well as panellings, its wavy figure giving it a beautiful character. It is close-grained, light in weight but liable to split; as a decorative timber it would make artistic cabinet-work when carefully selected as it has numerous knots and a great variety of colour and grain.

Callitris calcarata (spurred): This tree is found on the ridges or hills contiguous to the plains where *C. glauca* occurs. It is known as Black Pine from the colour of its bark, Red or Mountain Pine, but it is not solely restricted to elevations; and is well distributed in the eastern States, from northern Victoria to Central Queensland, and attains a height of 60 to 80 feet, with a dark, hard, compact, deeply-furrowed bark. The cones are in clusters or solitary, smooth, varying in shape and about 9 inches long. Its timber is immune from borers and water-insects, owing to the strong odour of its heartwood, consequently it is much used for house-building in the interior and also for under-water structures; being durable also in the ground it is suitable for building-piles, etc. It is dark with a strongly marked figure, and useful for panelling. Its resin has been used as a varnish and the young wood has been tested successfully for pulping and paper-making.

Callitris robusta (robust), known as Great Murray Pine, reaches 60 to 80 feet with a 2 feet diameter, also called Murrumbidgee Pine or Lachlan Pine, according to the river district in New South Wales which those trees frequent, and found in all the States but Tasmania, preferring the northern districts. The timber is soft and brittle with a slight camphor scent and a silky texture, easily worked, polishes well and makes a useful timber, varying in colour from light to dark-brown and occasionally reddish. It is fairly dense, often nicely marked, insect-resistant, but liable to dry-rot and very full of knots: the smaller trees are much used for stakes and fencing posts.

Callitris cupressiformis (cone cypress-like), the Victorian Cypress, is a native chiefly of Eastern Australia, more southerly than *C. robusta*, growing from South Australia to Southern Queensland but mostly in Victoria and Tasmania, from 20 to 50 feet high, with a 12 to 18-inch diameter. Frequently it is only a small tree and is distinguishable by its globular cones. The timber is used for building purposes and telegraph posts.



Courtesy Australian Paper Mills.

Planting *Pinus Radiata* (Monterey Pine)

Callitris verrucosa (warty) is a variety of *C. robusta* and called Mallee Pine because it is usually of small Mallee-like growth though sometimes it reaches 60 to even 90 feet in favourable situations, and is found in all the States but Tasmania. It is called Camphor Wood and also Rock Pine in New South Wales; it yields abundant resin, which is transparent, fragrant and very soluble.

Callitris intratropica (between tropics), probably a variety of *C. robusta* and known as the Kimberley Cypress Pine of Western Australia, attaining 80 feet in height with a 30-inch diameter. The rather thick and longitudinally-fissured bark is dark-gray and the timber is a hardwood, pale-yellow in colour, and not affected by white ants.

Callitris columellaris (central column prominent), a variety of *C. robusta*, known as White Pine, is native to New South Wales and Queensland and grows 60 to 70 feet high, with a diameter of 18 to 20 inches. Its timber is brittle, soft, dark-coloured, fragrant, and silky, and is used for indoor work, the root-stock suitable for turnery and veneers, being frequently nicely figured. As it resists the Teredo insect it is also used for wharf piles, the sheathing of boats, and telegraph posts.

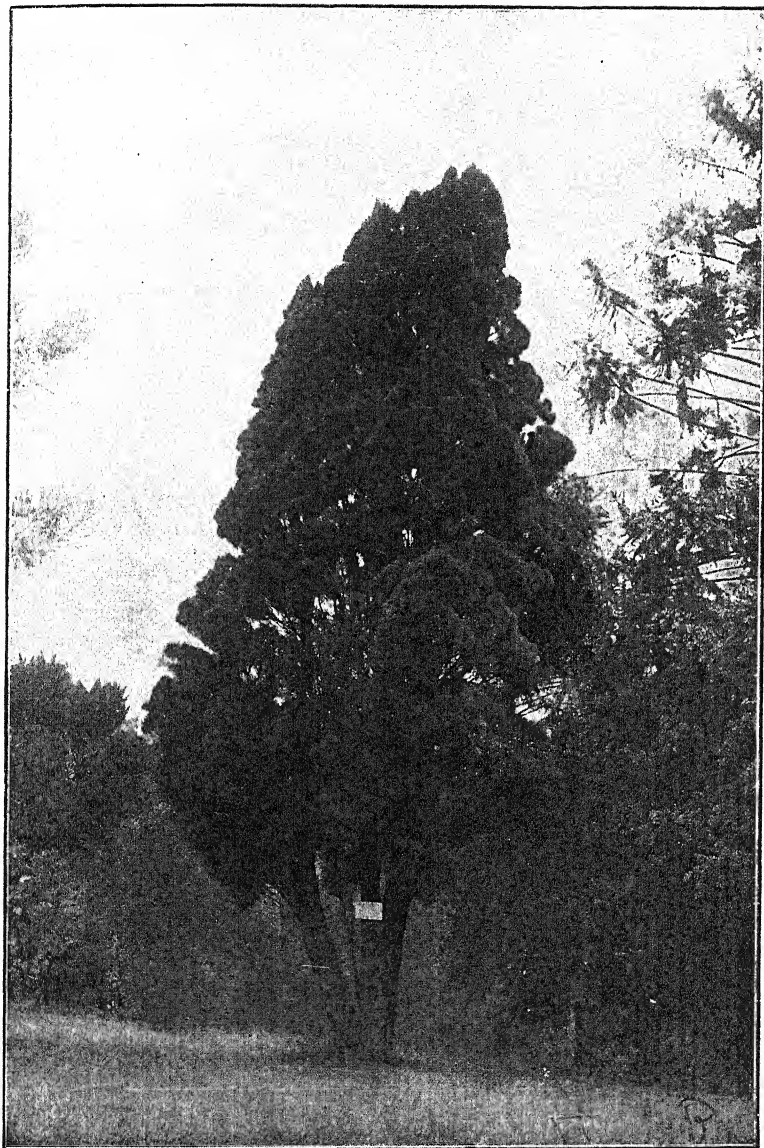
Callitris Muelleri (after Baron von Mueller): A tree 20 to 30 feet high with dense branches, the internodes prominently triangular with small scales, and growing in New South Wales and Queensland.

ARAUCARIA

(A Chilian name)

A genus, and an important one, of some ten species, widely distributed in Australia, also in Norfolk Island, New Caledonia and South America. It includes the specially interesting Bunya-Bunya Pine.

Araucaria Bidwillii (after J. C. Bidwill), Bunya-Bunya Pine: A native of south-eastern Queensland, between the Bunya Mountains on the south and Gympie on the north, but found also to some extent in the Blackall ranges in New South Wales. It is a large, symmetrical tree, with evenly dome-shaped crown and whorled branches, lanceolate leaves alternate without stalks and in crowded spikes, about one and a half inches long. The fruit-cones are 9 to 12 inches long by 7 to 8 inches in diameter, the egg-shaped seeds 2 inches or more long by about 1 inch broad. It reaches 100 to 150 feet in height, the unbranched, cylindrical stem sometimes being 80 feet. The very rough bark occasionally measures up to 6 inches in thickness, and is dark-brown or almost black. The large fruit-cones are rather like pine-apples in form and the egg-shaped seeds, weighing thirty



W. R. Guilfoyle, photo.

Callitris robusta (Great Murray Pine)

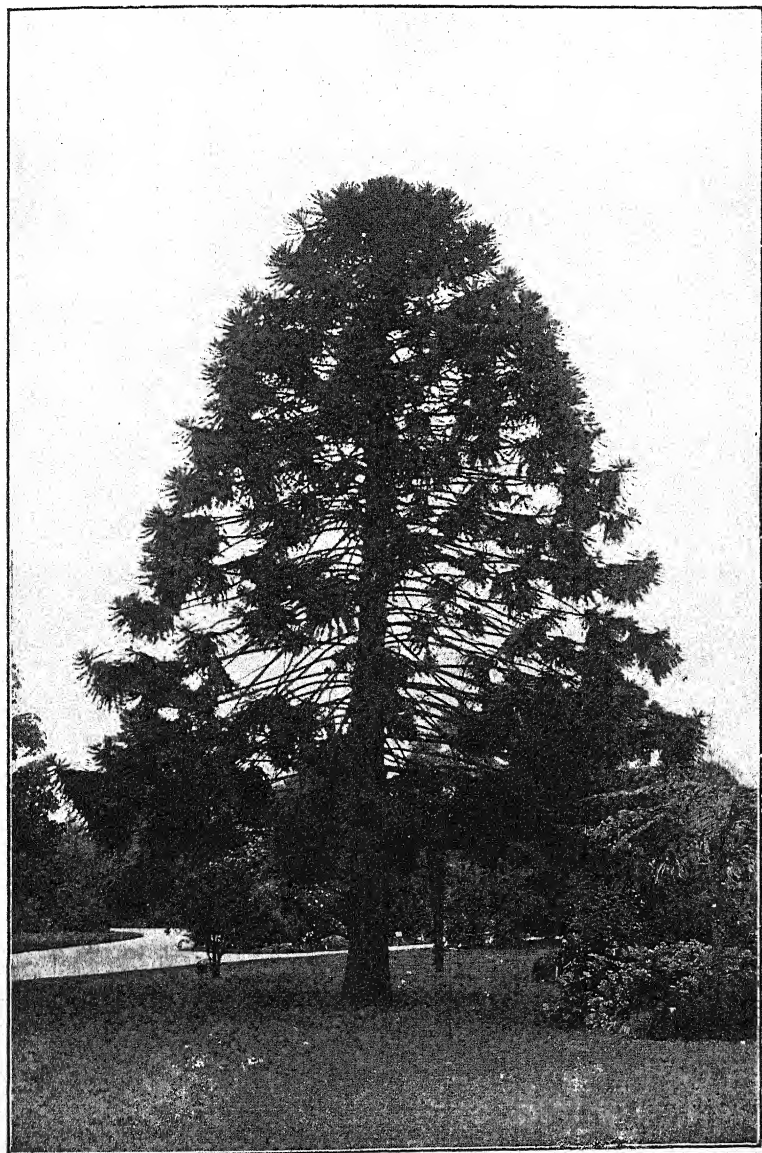
to the pound, are much valued for food by the aborigines, each tree being held to be the property of one family and so sacred to that family that stealing from it by a member of any other family would be the cause of a serious quarrel. The aborigines journey a hundred miles to the areas when the fruits are ripe (in January generally) and feast on the seeds. There are a large number of seeds in one cone and they are plentiful once every three years; the seeds are sweet before being perfectly ripe and are then like roasted chestnuts in flavour. The wood of *A. Bidwillii* is very strong, almost white, even-grained, with many beautiful veins, polishes well and works very easily, and is useful for indoor work. The tree has a pure and clear resin, bright red in colour, quite brittle and powders readily. It flows from every slight wound, is quite hard and very brittle externally, with a pleasant odour.

Araucaria Cunninghamii (after A. Cunningham), known as Moreton Bay Pine, Hoop Pine and Colonial Pine, and called by the aborigines, "Coorong," "Cumburtu" and "Coonam," possesses timber of great commercial importance, strong and durable when dry but decays when exposed to alternate damp and dryness. It is fine-grained, and polishes well. This magnificent tree of New South Wales and Queensland grows in coastal scrubs to as far inland as a hundred miles and extending to the highlands of New Guinea, though thriving only within certain climatic areas and not usually found in pure forests of its own, but with broad-leaved trees of other genera. Both the Bunya and Hoop Pines grow well when planted in the south as ornamental trees. Hoop Pine is a giant conifer, very tall, up to 150 feet, and often 5 feet in diameter, of quick though erratic growth, the unbranched stem sometimes 90 feet high. It has a conical crown which becomes flat-topped with age; it carries rather scanty foliage, the leaves triangular in shape, very narrow and curved, crowded on the branchlets without stalks; the fruit cones are ovoid 3 to 4 inches long. The bark is very dark-brown or nearly black, marked by transverse wrinkles or fissures having the appearance of horizontal bands like hoops (hence its popular name), and it is rough and hard.

PODOCARPUS

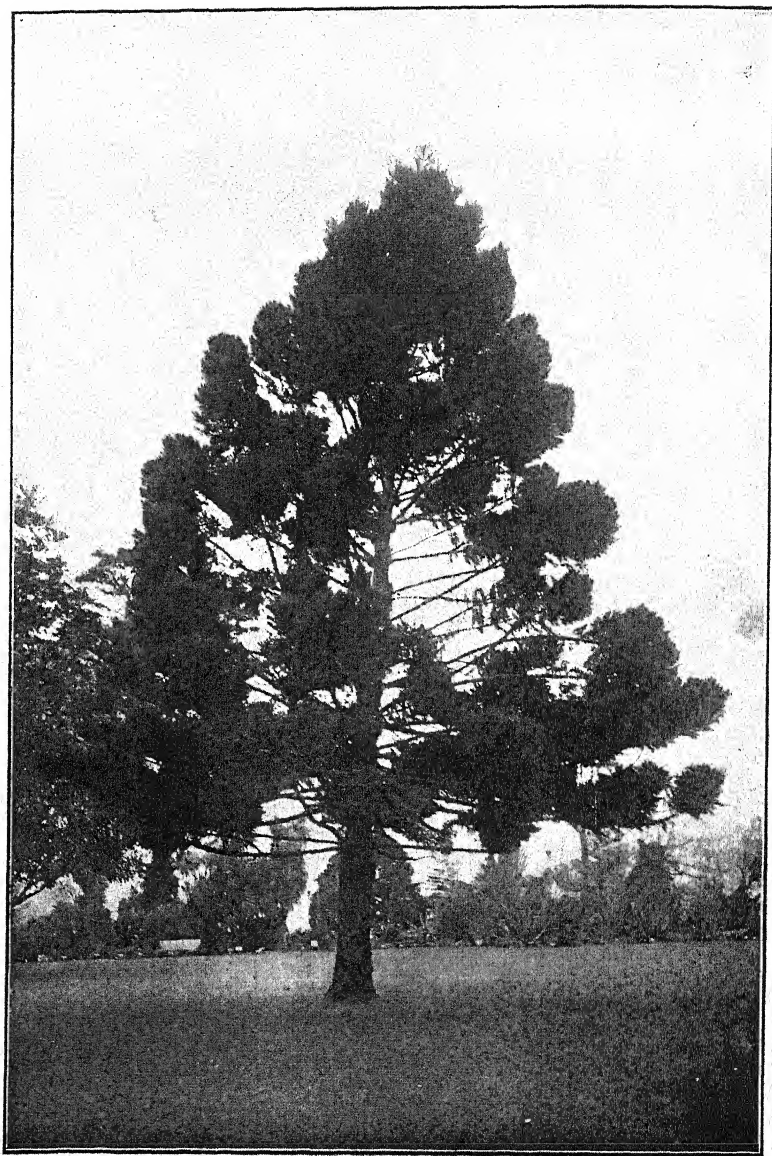
(Referring to the fleshy foot stalk of fruit)

The genus is dispersed over the tropical and subtropical regions from South Africa and New Zealand to Japan and over the whole of South America. The Australian species are endemic.



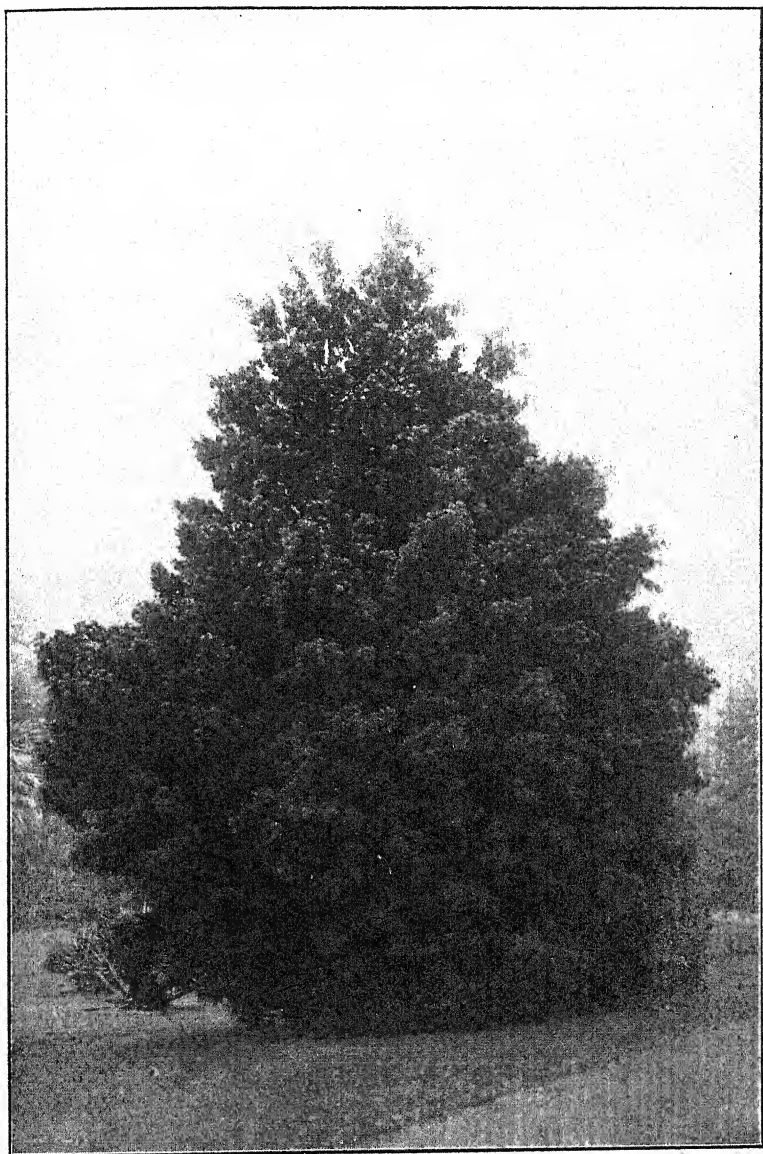
W. R. Guilfoyle, photo.

Araucaria Bidwillii (Bunya-Bunya Pine)



W. R. Guilfoyle, photo.

Araucaria Cunninghamii (Hoop Pine)



W. R. Guilfoyle, photo.

Podocarpus elata (Brown Pine)

Podocarpus elata (tall): The She-Pine of Queensland, known as Brown Pine or Yellow Pine, also Plum Pine from



Podocarpus elata

the character of its cones, occurs only on the coast of Eastern Australia, and is one of the largest trees of the brushes of New South Wales and the south of Queensland. It is a straight-growing tree, rarely cylindrical, attaining a height of 100 feet, with a diameter up to 3 feet; the leaves are sometimes over 5 inches long but narrow, and the small fruit red and fleshy. The timber is tough,

much interlocked, silky and fine in the grain, durable, seasons well, fairly strong for a Pine, and suitable for panelling. When found with a figure it has a peculiar mottled appearance not easily described and often of surpassing beauty, the colour at first yellow but toning on exposure to a very pale brown, hence its two descriptive names. It is not readily attacked by white ants, dresses very well, and is suited for joinery, furniture and wood carving.

Podocarpus alpina (alpine), is a small tree sometimes growing to 30 feet, found in Victoria 3000 feet above sea-level (hence its specific name), and also in New South Wales and Tasmania. In Victoria it is the only representative of its genus.

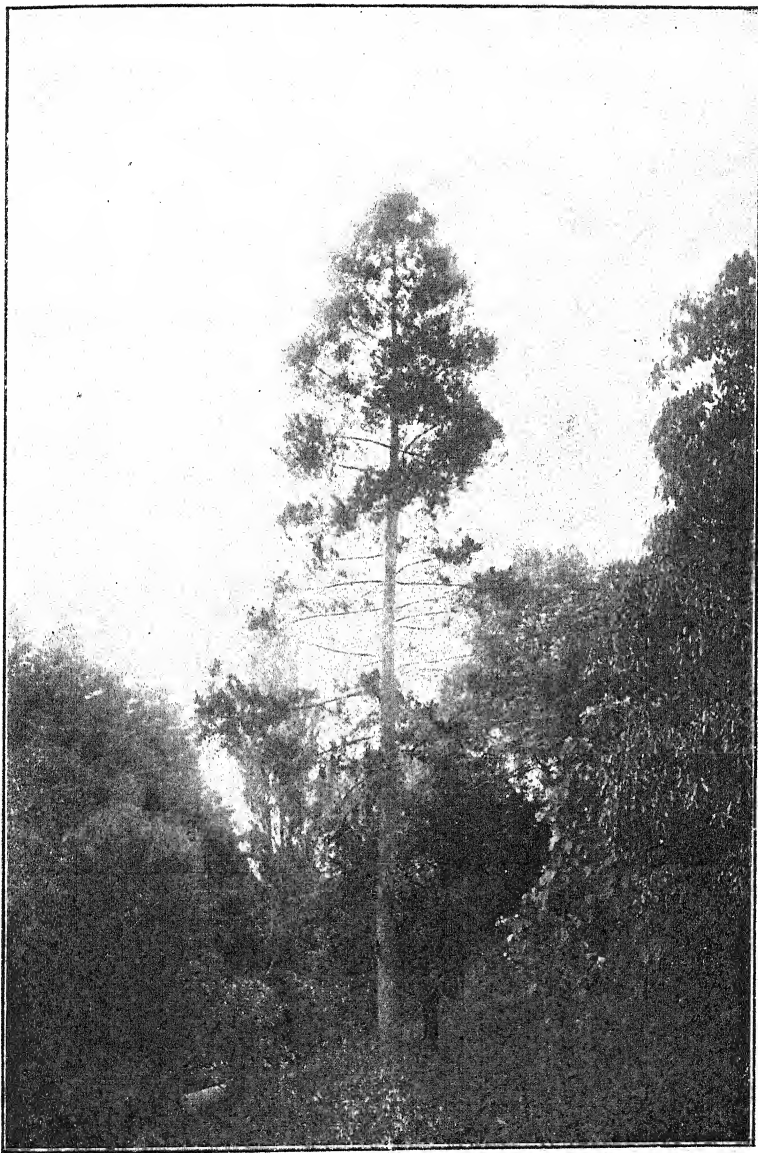
AGATHIS

(Clustered flowers)

Besides the Australian species which are endemic, there is one in East Indies and the Archipelago, one in New Zealand, and three in New Caledonia.

Agathis Palmerstoni (after C. Palmerston), endemic to Queensland, is a large jungle tree, ascending in its habitat from the Mulgrave River to high mountain altitudes. It has angular branchlets, and narrow-elliptical leaves gradually narrowed into a very short petiole, blunt, somewhat oblique, and pale on the under sides; the cones are oval and smaller than in any other species of the genus.

Agathis robusta (robust), the Queensland Kauri Pine or Dammara Pine or Dundatha Pine, is a scarce tree sparsely dis-

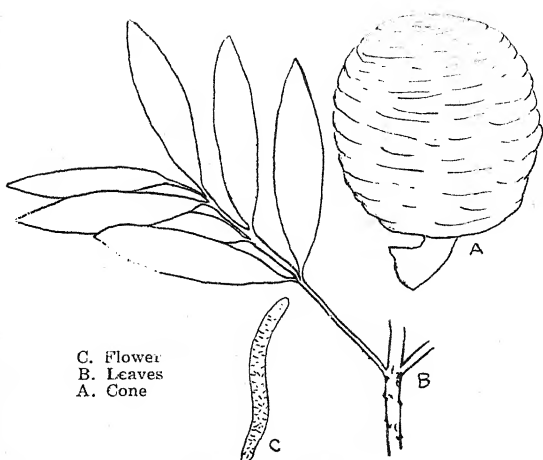


W. R. Guilfoyle, photo.

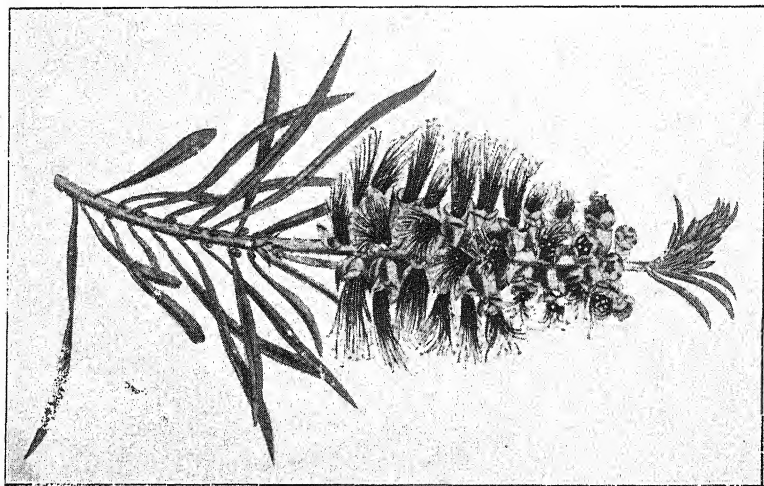
Agathis robusta (Queensland Kauri Pine)

tributed on the coastal ranges of its native State. It is the only Conifer from which it would be possible to obtain turpentine, but owing to its scarcity and inaccessibility, it is not of much economic value.

It is a fine, tall, erect tree with ovate opposite leaves, 4 to 6 inches long, with a long, straight, branchless trunk, growing from 50 to 150 feet or more in height, and one of the native Australian hardwood conifers. It is a shade darker in colour than New Zealand Kauri timber, being pale-brownish, dresses well and takes a good polish, and is suitable for table-tops, furniture or any cabinet-work, also for mouldings, skirtings and architraves.



Agathis robusta.



Flowers and Leaves of *Callistemon rigidus*
(Bottle-brush Flower)

THE MYRTLES

*Upon the hills are Myrtles blooming—
 Dark tea-tree glades
 Toss their light foam like banners triumphing,
 White Burgan wades
 Knee-deep in summer grass, a month ago
 Heath-myrtle sweet
 Laughed and turned rosy—crimsoning her snow
 On flying feet.
 Of scent she brought dear memories. The gums
 Star-crowned and tall
 Baring their limbs as every zephyr comes,
 Sing over all.*

There are several so-called Myrtles in Australia, the term being used rather freely for trees and shrubs having certain characteristics of the Myrtle family. Thus we have *Eucalyptus*, *Callistemon*, *Melaleuca*, *Leptospermum*, and *Eugenia* as the most important of the same group.

CALLISTEMON

(red stamens)

A genus of eighteen species of trees and shrubs in the various States of the mainland but not in the far north, and a few also in Tasmania. These are elegant but sometimes rather straggly, suitable rather for shrubberies than small gardens, the shrubs being very wide-spreading. The leaves, which are always scattered, of some species are long, narrow, lanceolate, and drooping, and are very beautiful, especially when the tips are coloured in the Spring, just before flowering; in some species they are short, stiff and erect; this is especially the case of *C. rigidus*. The flower-spikes are always bottle-brush shaped, some longer than others and varying in colour in the different species from pale-yellow to various shades of red, usually red or brilliant red.

Callistemon citrinus (somewhat yellow) : A tall shrub but sometimes a tree attaining a height of 30 feet. It has narrow, rigid, lanceolate leaves 1 to 2 inches long and very large crowded flowers in shades of crimson. Its wood—a red—is hard and heavy, used in wheelwright's work, and for making mallets and other implements, a characteristic being that its shavings bind like ribbons.

Callistemon salignus (willow-like) : A tall shrub or small tree attaining sometimes 30 to 40 feet, with pale-pink or creamy flowers and willow-like, broad linear to narrow lanceolate leaves. It has very hard and close-grained wood which is

durable underground, varying in colour from drab to dark-red, and often showing a very nice grain when polished and is useful for any purpose where strength and durability are required.

Callistemon viminalis (flexible twigs): A tree occasionally reaching a height of 60 feet, though usually a tall shrub, with pendulous branches, coarse persistent bark, and red flowers. The seed-vessels are small and round, in close clusters on the branches like the flowerets forming the bottle-brush, one cluster for each year, the seeds being minute. The timber is strong and tough and, being durable underground, is used for fencing-posts.

MELALEUCA

Of the genus *Melaleuca* (from "mela," black, and "leukos," white, referring to the old and new bark), there are over one hundred species altogether, of shrubs and small trees of erect habit and large in only some cases. They have bottle-brush flowers, ranging from white or yellow to pink or purplish in colour, and seed-vessels more or less crowded on the stalk. All are solely Australian but one, *Melaleuca leucadendron* (white-branched), which is also found in the Malay States and the Philippine Islands. It has hanging branches and greenish flowers and reaches a height of 50 to 80 feet, but has been known to reach 100 feet. It gives an important oil closely resembling cadjuput oil—one hundred pounds of leaves yielding five ounces of oil, which is as useful as Eucalyptus oil for medicinal purposes and more fragrant in odour. The popular use of the term "tea-tree" for *Melaleuca* is erroneous, the *Leptospermum* being the genus from which a kind of tea-like beverage was infused in the early days of settlement here.

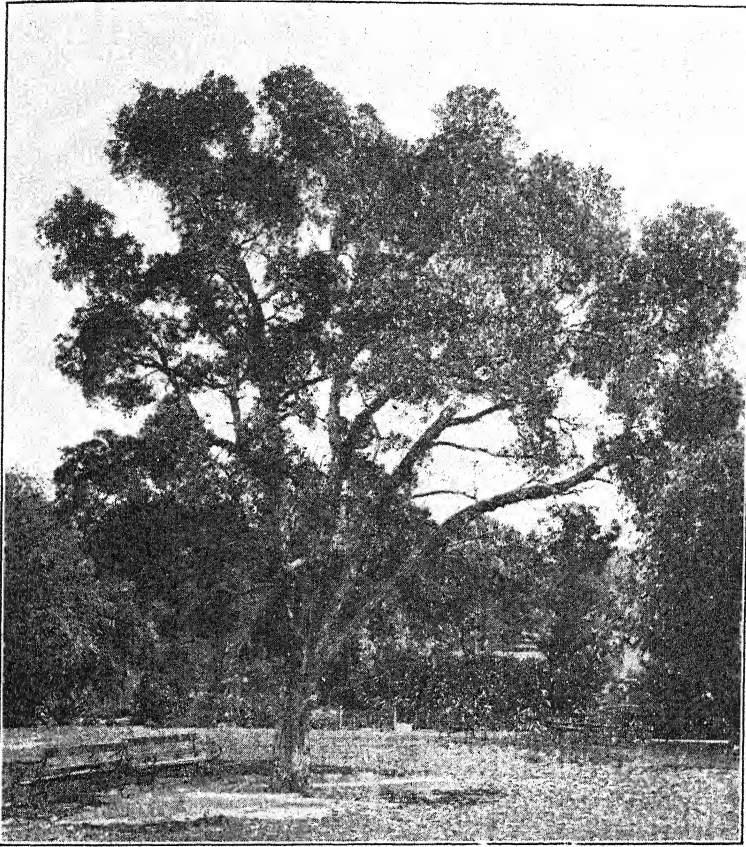


*Melaleuca
hypericifolia*

Melaleuca hypericifolia (*Hypericum*-leafed), known as Hillock Tree, though only 12 to 20 feet high, and native to New South Wales, has large, red flowers and rather large, flat, lanceolate to ovate-elliptical leaves, and is extensively cultivated in other States.

Melaleuca styphelioides (*Styphelia* - like), the Prickly-leaved Paper-bark Tea-tree (as it is called) of New South Wales and Queensland, grows 20 to 30 feet high. The bark is useful for packing, and for caulking boats.

Melaleuca squarrosa (strong smelling): Usually small, but occasionally growing to 30 or 40 feet with whitish, scaly bark and yellow flowers, found in Victoria, New South Wales, South Australia and Tasmania, preferring moist



N.S.W. Government Printer, photo.

Melaleuca leucandendron (Cajuput-oil Tree)

situations. It has a fairly hard and tough timber suitable for cabinet-work.

Melaleuca linariifolia (Linaria-leaved): Known as Flax-leaf Paper-bark, and native to New South Wales and Queensland, a fairly tall tree 40 to 50 feet high, with slender branches, the leaves mostly opposite, linear or linear-lanceolate, $\frac{3}{4}$ to 1 inch long, the flowers in distinct pairs, in dense spikes of 1 to 2 inches, the fruiting-calyx small and seeds minute. The wood is valuable for piles in swampy ground, also useful for turnery and makes excellent fuel.

Melaleuca pubescens (pubescent): Known as Moonah and native to Victoria, New South Wales, South Australia and

Queensland, a small tree 20 to 25 feet high, with a rough, dark bark, the leaves alternate, about $\frac{1}{2}$ inch long, linear to narrow-lanceolate, the whitish flowers in spikes 1 to 2 inches long, the fruit almost globular. The wood is pale when freshly cut, drying to a pinkish-brown, tough, hard, dense and durable. This tree is excellent for holding moving coast-sands.

Melaleuca genistifolia (Genista - leaved): This species known as White Cloud Tree and Snowy Fleece Tree on account of its "smother" of white blossoms, is found in the north and north-east, and grows 40 to 60 feet in height. Its wood is grey, hard, close-grained and tough.

LEPTOSPERMUM

(fine seed)

This genus consists mainly of shrubs, only eight of the nearly thirty species (all Australian but three) being trees, which grow in some instances as high as 80 feet, but generally 20 to 40 feet. Usually they have small Myrtle-shaped leaves, and small star-like, smooth and flat or crinkly flowers of a white or pinkish colour.

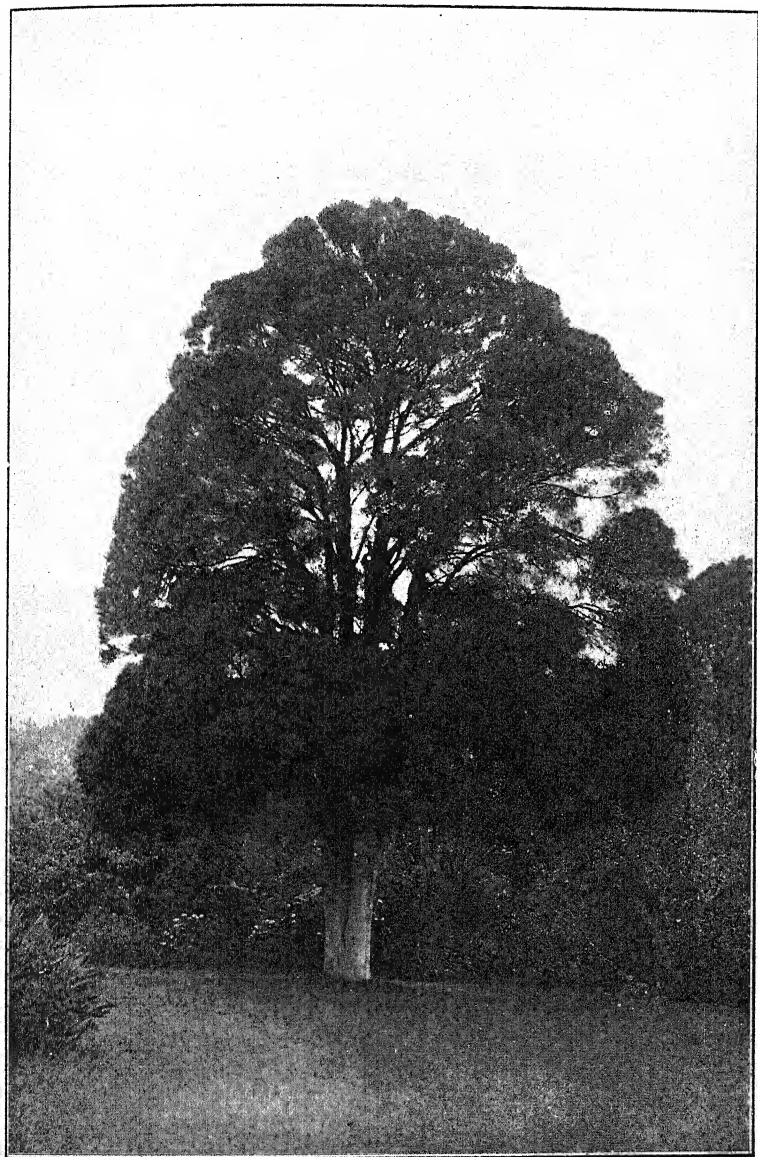
Leptospermum lanigerum (woolly) is known as Woolly Tea-tree because of the soft, spreading hairs at the base of the flowers. The leaves are obovate, elliptical, sometimes narrow and frequently rather acute. This small tree grows in New South Wales, Queensland, Victoria, South Australia and Tasmania.

Leptospermum laevigatum (smooth): The well-known Coastal Tea-tree, or sand-stay of the east and south-east, grows sometimes in its less straggly and weather-beaten form to 30 feet, and is popularly known as Captain Cook's Tea-tree in Australia, but it was from *L. scoparium* that the great navigator first got the leaves he brewed to make "tea." The wood is small and light-coloured, but darkens towards the centre, and is useful for light poles, trellis-work, etc.

EUGENIA

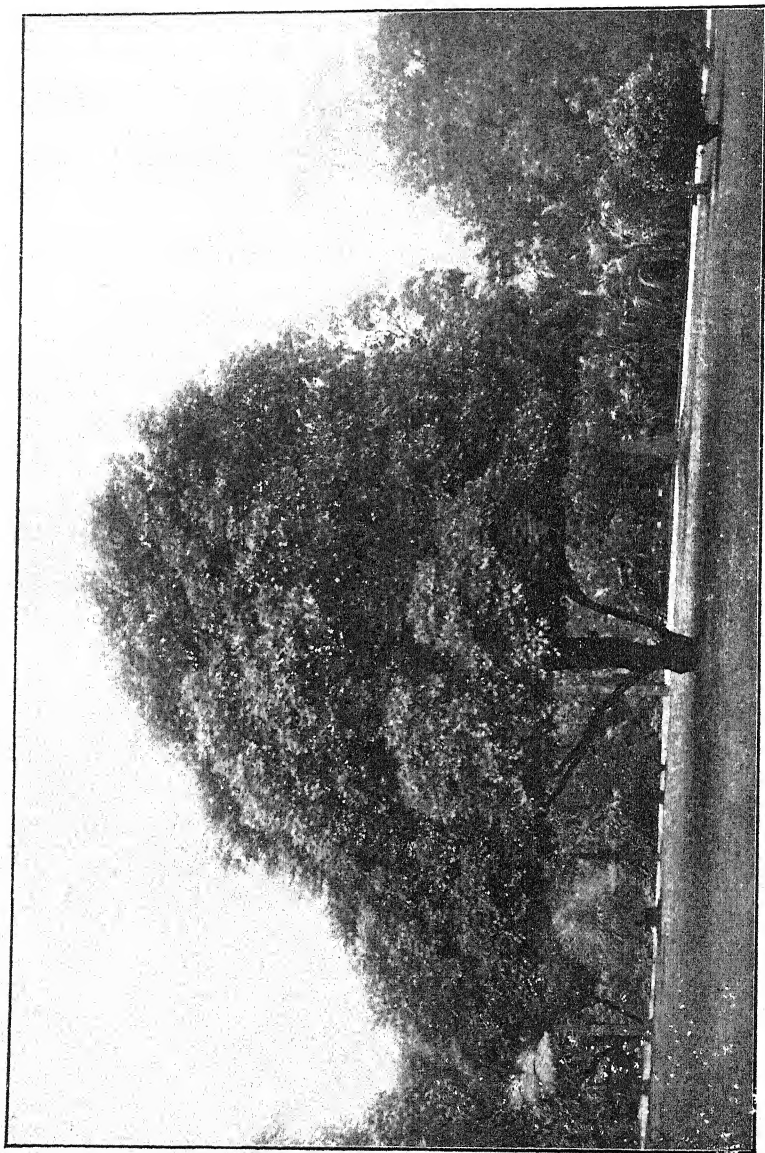
(After Prince Eugene of Saxony)

Known by nurserymen and others as *Acmena*, having several decorative species; many are very plentiful in tropical America, and there are only twenty which are native to Australia. Some are trees growing to 50 or 60 feet or even 100 feet and more. All the Eugénias, but one, have small white



W. R. Guilfoyle, photo.

Melaleuca styphelioides (Prickly-leaved Paper-bark Tree
Myrtle).



W. R. Guilfoyle, photo.

Eugenia Ventenatii (Drooping Tree Myrtle)

flowers, the exception being the Jambolana Tree (*E. Jambolana*) which has red flowers. *Eugenias* have berries that are edible.

Eugenia parviflora (small flowered), is known as Australian Rose Apple, Brush Cherry, or Red Myrtle, reaching 50



Kerr Bros., photo.

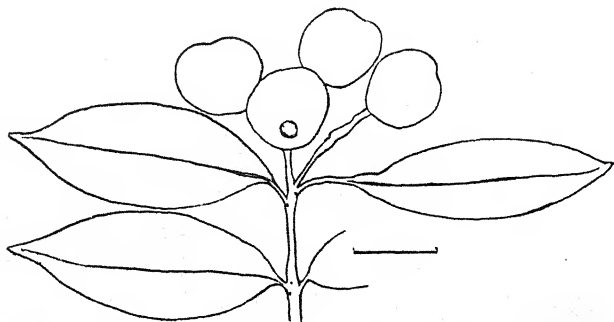
Eugenia Smithii ("Lilly-Pilly")

to 100 feet with an 18-inch diameter, and occurring in New South Wales and Queensland plentifully on the water-courses. The timber is useful for indoor work, the flowers white and the berries rose-coloured.

Eugenia Smithii (after J. Smith): This favourite garden species, well known as "Lilly-Pilly," grows naturally in New South Wales, Queensland, Victoria and North Australia, as a slender tree reaching 80 to 100 feet, but is often seen in gardens as a shrub; its bright bronze-green myrtle leaves and plentiful

bunches of fairly large purple berries being very decorative. It is sometimes called the Australian Myrtle. Its wood has a wavy interlocked texture like that of the *Melaleucas* and is of a pinkish-gray colour, fairly easy to polish, and suitable for cabinet-work, golf-sticks and for veneers.

Eugenia brachyandra (short stamens): Known as Red Apple, a glabrous tree reaching to 100 feet in height and with a 3-foot diameter, somewhat buttressed at the base and growing in the coastal scrubs of Eastern Australia; its berries are globular, red when ripe.



Eugenia brachyandra (Red Apple)

Eugenia Moorei (after C. Moore): One of the "Lilly-Pillys" and native to New South Wales and Queensland with clusters of round, rose-scented berries, an ornamental tree growing to 80 feet, with a diameter of 24 to 36 inches. The timber is firm and close-grained and useful for building purposes; weight 49 lb. per cubic foot.

Eugenia Ventenattii (after E. P. Ventenat): The Weeping or drooping Tree Myrtle reaches to 100 feet in height with a diameter of 2 feet, and has long, dark-green, glossy leaves 2 to 5 inches long and about a quarter in width, the fleshy berries nearly globular. It is a drooping-branched and bushy-shaped tree frequently seen in large gardens and native to New South Wales and Queensland, where it is found abundantly in light scrub and frequenting the banks of freshwater streams.

Eugenia corynantha (flower-bud club-shaped), known as Sour Cherry, attains a height of 100 feet, the stem rather flanged at the base, and grows in the coastal scrubs of New South Wales and Queensland. Its bark is gray, rather scaly and wrinkled longitudinally, and it flowers in June, though most



W. R. Guilfoyle, photo.

Agonis flexuosa (Willow Myrtle)

of the *Eugenias* flower in November and December; the fruit is red when ripe and very acid.

Eugenia Francisii (after W. D. Francis): This tree occurs in the coastal scrubs between the Richmond River, New South Wales, and Gympie, Queensland, and is called Rose Satin Ash and Giant Water Gum, the latter on account of the quantity of watery sap which flows when the tree is being felled; it reaches 100 feet with a 5-foot diameter, the trunk prominently buttressed at the base, the timber pinkish and close-grained, but not much used.

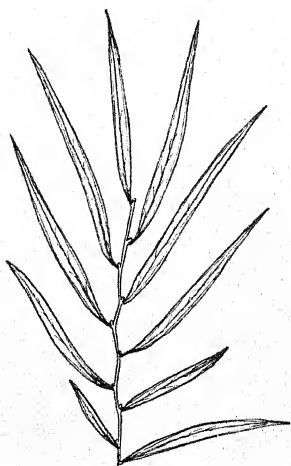
Eugenia hemilampra (face of leaf glossy), reaches 100 feet in height with a 2 to 3-foot diameter, and is very similar to *E. Smithii*, growing in the area from the Clarence River, New South Wales, to Cape York.

Eugenia Luehmanni (after J. G. Luehmann), the small-leaved Water Gum or Cherry Alder, attaining 20 feet, has a buttressed trunk in the older trees, which are similar to *E. Francisii* in appearance. It grows in the coastal scrubs from the Richmond River, New South Wales, to Cairns, Queensland.

AGONIS

(without angles)

A genus of thirteen species, mostly Western Australia.



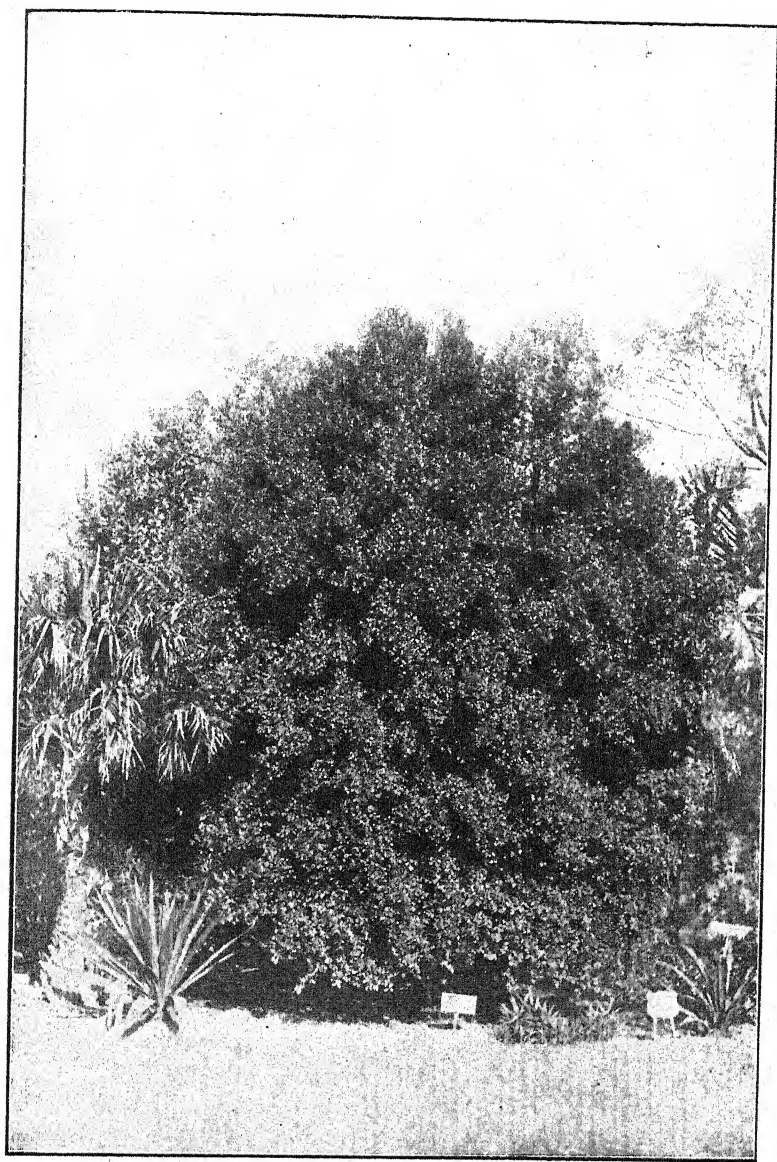
Agonis flexuosa

Agonis flexuosa (twisted): The Western Australian Peppermint, called also Willow Myrtle, is the best known, and abounds in the Tuart Gum forests of the south-west. It is a very ornamental tree of about 40 feet in height, and particularly attractive when its small, white, velvety flowers cover its long, narrow, dense, drooping foliage, so that it looks as if sprayed with snow. There is a horticultural variety of this species in a variegated form.

Agonis juniperina (Juniper-like): The Juniper Myrtle, also of Western Australia, is from 20 to 40 feet high. The leaves are linear-lanceolate about 6 inches long, the flowers in globular heads. It is found near the Blackwood river and by lagoons.



Callitris calcarata
(Black or Cypress Pine)



W. R. Guilfoyle, photo.

Backhousia myrtifolia (Scrub Myrtle)

BACKHOUSIA

(After James Backhouse)

A genus of five species in New South Wales and Queensland, one extending to Victoria. They are tall shrubs or small trees.

Backhousia Bancroftii (after Dr. T. L. Bancroft), the Johnstone River Hardwood of Queensland, is one of the best trees in the scrubs of the north-east. The timber, which is light-gray, hard and close-grained, resembling Teak, is suitable for building purposes.

Backhousia citriodora (Citron-scented), the Sweet Verbena Myrtle of Queensland, grows 20 to 25 feet in height, with white flowers in clusters and opposite lance-shaped leaves, 3 to 5 inches long. The leaves and the branchlets when crushed have a citron scent. The timber is light-pink, hard and fine-grained.

Backhousia myrtifolia (Myrtle-leaved), the Gray Myrtle or Scrub Myrtle, also known as Blackfellow's Lancewood. It is found in Eastern Australia, 20 to 40 feet high, with opposite, ovate to broad, lanceolate leaves coming to a point, and fairly large white flowers in cymes. It yields a fragrant dark-yellow oil, and its timber is hard, straight and close-grained (weighing 65 lb. to the cubic foot), pinkish-gray with a dark-brown centre, and useful for carriage building and constructional work on account of its toughness and strength, and excellent for axe-handles.

MYRTUS

(From "Myron," perfume)

A genus of about a dozen species of trees and tall shrubs of Northern New South Wales and Queensland.

Myrtus acmenioides (Acmena-like): A tall, glabrous tree with ovate leaves up to 3 inches long, growing from 35 to 50 feet, and having a plain wood that weighs 61 lb. and which is very hard, durable, tough, and close-grained, lighter in colour than others of the genus, hence its popular name of White Myrtle.

Myrtus Bidwillii (after J. C. Bidwill): A small, glabrous tree with shiny, broad, ovate leaves with a long lanceolate point, which are 2 to 3 inches long; the flowers are numerous in short, loose racemes and more abundant than in *Myrtus racemulosa*. It is endemic to Queensland.

Myrtus Hillii (after W. Hill), is a tree known as Scrub Ironwood, growing to 60 feet with a smooth, thin bark,

bright-green with patches of brown, shed in narrow twisted flakes, and blunt-pointed, glossy, opposite leaves; its light-gray timber is very hard.

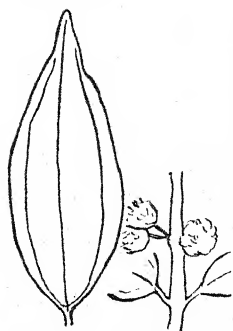
Myrtus racemulosa (flowers in racemes at times): A small, glabrous tree with ovate or acuminate leaves 1 to 2 inches long, and nearly globular fruit. The wood is tough and close-grained. It is endemic to Queensland.

RHODAMNIA

(Rose-like)

A genus of four Australian species, also found in tropical Asia.

Rhodamnia argentea (silvery-leaved): A scrub tree growing from 50 to 100 feet, with a diameter up to 3 feet, in the coastal scrubs of New South Wales and Queensland. Its irregular-shaped opposite leaves are 2 to 4 inches long and half that wide, and it has small white flowers in cymes, and small, globular, black, fleshy berries; the base of the trunk is often channelled or slightly flanged, and has reddish-brown or gray bark finely fissured and often flaky. Its wood is hard and durable, light-gray, with a pretty, small, silvery grain, suitable for golf-sticks and gunstocks, also for cabinet-work, panelling, coachwork and general building purposes.



Rhodamnia trinervia

Rhodamnia trinervia (three-veined), known as New South Wales Black-eye Wood, Scrub Stringybark, Scrub Turpentine, Brown Mallet-wood, and Moreton Bay Myrtle. It grows to 90 feet, with a diameter of two and a half feet, in New South Wales and Queensland from Illawarra to Gympie, and has reddish-brown bark, prominently fissured, yellow to brown sapwood, and timber suitable for indoor building work.

RHODOMYRTUS

(Rose Myrtles)

A genus of four species native to Australia. They are small trees and shrubs and have pretty, clustered pink or white flowers and berries.

Rhodomyrtus macrocarpa (long-fruited), is a small tree with leaves 6 to 10 inches long, penniveined and reticulate and

large seeds in a cylindrical pod, and hoary flowers. Wood light-gray, hard and tough. Endemic to Queensland.

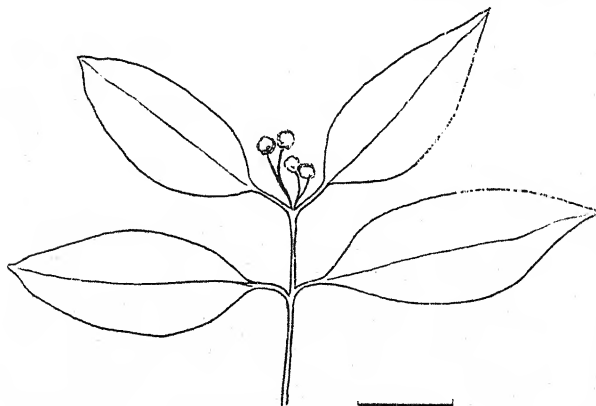
Rhodomirtus psidioides (Guava-like), is a tree reaching 40 feet in New South Wales and Queensland, and known as Guava Myrtle; opposite ovate-lanceolate leaves 3 to 6 inches long, with a blunt point at apex, rather large flowers in panicles, and egg-shaped or globular fleshy fruit. The wood is light-coloured, hard, tough, close-grained, and generally useful.

SYNCARPIA

(Referring to the carpels being united)

A genus of ten species. The trees of this genus are known as Turpentine Trees from the orange-red, resinous exudation between the bark and the wood, and obtainable also from the seed-vessels, but in greatest quantity by felling the tree; it resembles Venice turpentine. The bark is used for tanning.

Syncarpia Hillii (after W. Hill), a Turpentine Tree, is found in Frazer's Island, Queensland, and known by the aborigines' name for it as "Peebeen." Its wood is dark-pink, close-grained, and useful for building purposes.

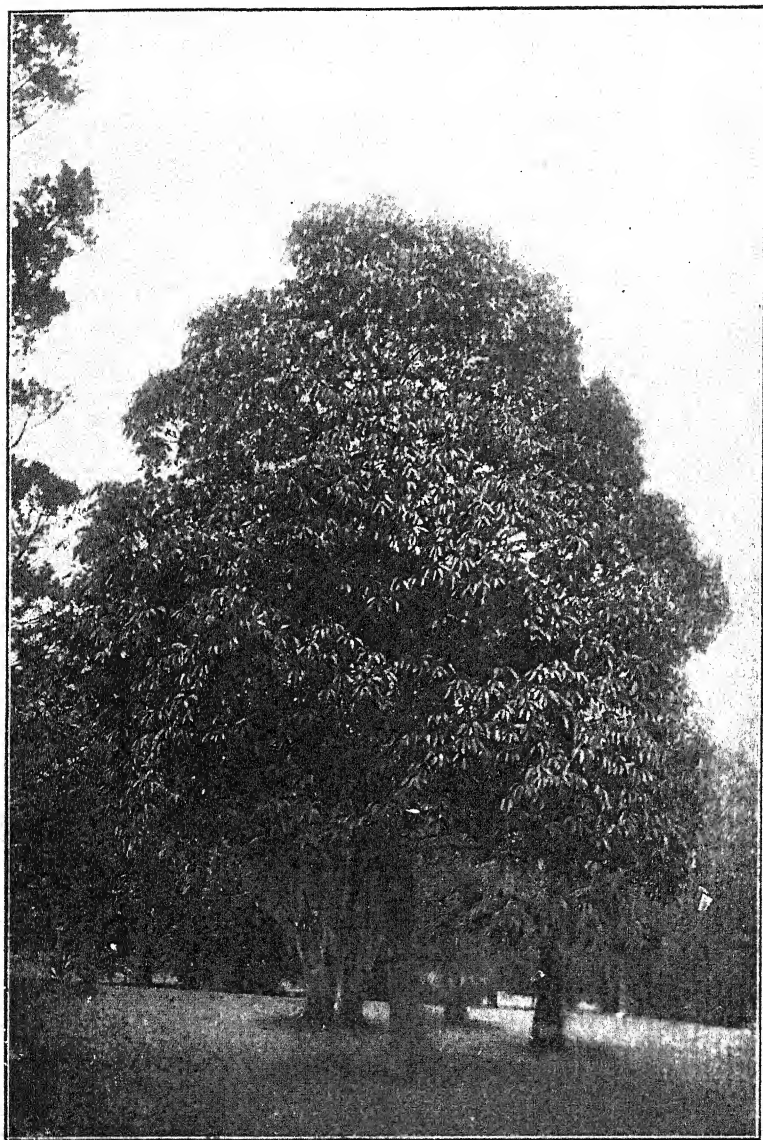


Syncarpia subargentea

Syncarpia subargentea (silvery underneath), known as Giant Ironwood and resembling *Myrtus Hillii* in the smoothness and colour of its bark, but grows to a much larger size, about 120 feet, with

a diameter of nearly 3 feet. The stem is frequently buttressed at the base, the bark very smooth and shiny, brown, green, or copper-coloured, and shed in thin flakes. It is confined to Queensland, and is very common in the scrubs there.

Syncarpia leptopetala (narrow petals), is a rather small tree and at most 50 to 60 feet high, with a 24-inch diameter. The timber is similar to that of *S. laurifolia* but a little more



W. R. Gullfoyle, photo.

Tristania conferta (Queensland Box-wood)

open in the grain, hard, heavy, and durable, useful in building. Its habitat is in the coastal scrubs of the east.

Syncarpia laurifolia (Laurel-leaved), is a large, shady brush tree found only, but abundantly, in the coastal districts of New South Wales and Queensland. It reaches about 100 feet usually, but in exceptional cases as much as 200 feet, with a 5-foot diameter and a long, straight, branchless trunk. It is a handsome tree for shade and street-planting—its dark-green, oval-oblong leaves 2 to 3 inches long, with dense, woolly hairs on the underside, and its creamy flowers in dense heads, the bark thick and matted. The timber is a dark pinkish-brown colour, hard, tough, very durable, heavy (63 lb.), similar to that of some of the Red Ironbarks, resistant to marine insects when the timber with bark on is used for piles, and especially useful for building and for girders and pillars, as its resin protects it from borers, but it is not popular with sawmillers, as it blunts the saws very quickly.

TRISTANIA

(after Charles Tristan)

A genus of twenty species native to Eastern Australia, and found also in Malaysia.



*Tristania
laurina*

Tristania laurina (Laurel-like), known as Water Gum because it grows near streams, and Turpentine Box, and also called popularly "Kanooka," which is the name the aborigines knew it by. It reaches 40 to 60 feet with a diameter of 2 feet in exceptional cases, but is usually a small tree found in Victoria, New South Wales and Southern Queensland, and has a timber, well known in the trade, it being very dark-red in the centre, very close in the grain, hard, weighing 60 lb., requiring care in seasoning but useful for coach and boat building—its smaller wood is used for tobacco-pipes, whip-handles, etc.

Tristania neriifolia (Oleander-leaved) is a small tree, known as Water Gum or Water Myrtle, and native to New South Wales, with red timber, difficult to season without rending, but very close-grained and elastic when dry (61 lb. in weight), and much favoured for carriage frames and boat-building and suitable for paneling, mallets, spokes, etc.

Tristania conferta (crowded leaves): A large and ornamental brush tree, very common on the borders of the scrub-

forest country of the coastal districts of southern New South Wales, Queensland and North Australia, being confined to Australia, and known as Queensland or Brush Box by foresters. It grows from 80 to 150 feet, and even to 200 feet, with a



Leaves, Flower and Fruit of *Tristania conferta*

diameter from 3 to 7 feet, usually with a dense, spreading head, the general appearance rather like a Fig tree on account of its leaves, the stem smooth and reddish; but it is sometimes no larger than a shrub when on poor hilly ground. The young shoots and often the flowers are covered with silky hairs; the large, distinctive, and shiny leaves are 3 to 6 inches long (the underside slightly paler than the upper, with fine net-veins usually); the white flowers in dense cymes on short stalklets towards the end of the branchlets, one to one-and-a-half inch long. This tree is very suitable for street planting, being an ornamental shade tree, but a slow grower. The timber is hard and weighs 54 lb., and is much prized for strength and dura-

bility, and used especially in shipbuilding, for wharves and bridges, in house-construction as it is white-ant proof, also for sleepers and joists.

Tristania exiliflora (slender flowers): This species, native to Queensland, has a dark-coloured wood, close-grained, very tough and elastic, good for tool-handles.

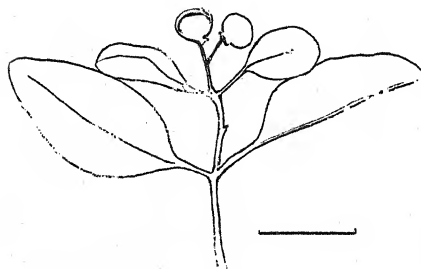
Tristania saueolens (sweet smelling), the Swamp Turpentine, of New South Wales, Queensland and North Australia, very like *Syncarpia laurifolia* in appearance, grows to 50 or 60 feet; its wood resembling that of *T. laurina*.

XANTHOSTEMON

(yellow stamens)

A genus of three species in Australia; there are also a considerable number in New Caledonia.

Xanthostemon chrysanthus (golden-flowered), native to Queensland, a 40-foot tree with golden flowers, known as Golden Myrtle, but more generally as Southern Penda. Its wood is fine in grain, tough and strong.



Xanthostemon oppositifolius

Xanthostemon

oppositifolius

(opposite-leaved), limited to Queensland, and confined to a relatively small area of the coastal scrubs, between Maryborough on the north and Nambour on the south. It is a large tree growing to 100 feet, with a diameter of 5 feet.

The trunk is sometimes flanged but not prominently buttressed, and the timber is brown in colour, often interlocked, and very hard and heavy, but not durable in the ground.

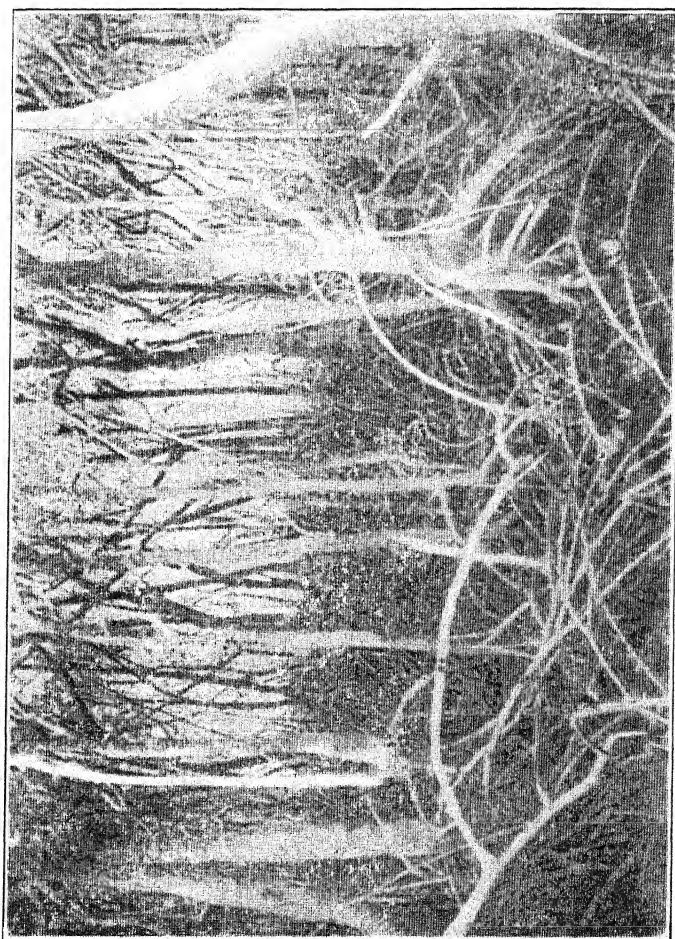
Xanthostemon pachyspermus (thick seeds), is a glabrous tree of medium size, the leaves alternate, petiolate, ovate-lanceolate, 3 to 5 inches long, and the flowers in panicles 2 to 3 inches long. Its wood is gray, fine grained, tough and strong.

THE MANGROVES

The Mangrove flourishes on the banks of all the rivers and creeks of North Queensland and on many sheltered beaches, and performs an important function in the scheme of nature. Plants require certain constituents of the soil and certain distinctive surroundings, in order that they may grow well and fulfil their purpose. The Mangrove delights in conditions that few tolerate—salty, muddy ooze, and frequent floodings by the sea. In shallow water, the sharp end of the spindly radicle fastens into the mud, and slender but tough roots emerge in radiating grapples, leaves come out at the other end, and this plan proceeds. There is nothing peculiar in the growth of the plant in the early part of its life, but in a few months it sends out arching, adventitious roots which reach the mud and hold it with strong finger-like rootlets. These arching roots also send out from their arches other roots that arch, and these, in like manner, repeat themselves until the tree is supported and stayed by a perfected and complicated system which offers no resistance to the sweep of the sea, and holds the tree as no solid trunk or stem could. Then from the plan of arches off-shoots spring which in time become trees equal to the parent. Aerial roots begin a downward course from the overhanging branches and fasten themselves in the mud. Some young seedlings drop, and their pointed ends stick in the mud and grow, to have arching and aerial roots of their own and so on. Among the interlacing roots, much debris of leaves, seaweed, sodden driftwood and sand collects, and as the level of the floor of the ocean is raised the sea retires, contributing by the flotsam and jetsam of each spring-tide to its further retirement.

In the first rank will be found the hardiest and most highly specialised—*Rhizophora mucronata*, next *Bruguiera gymnorhiza* (a plant of slightly more lowly growth, but prolific of arching and aerial roots), and *Bruguiera Ruedi* (red and orange mangrove). Some of the roots of the latter spread over the surface and have vertical kinks. The roots and accessories act as natural groins, causing the waves to swirl and to precipitate mud and sand. *Bruguiera parviflora* and *Ceriops Candolleana* assist in the general scheme, the former depending upon abutments for security instead of adventitious roots. Remarkable also is the help that the White Mangrove, *Avicennia officinalis*, affords in the scheme by its system of strainers. It has erect, obtrusive, respiratory shoots from the roots, slender in comparison, resembling asparagus shoots, which strain the sea-water, retaining light rubbish and assisting to hold and consolidate it all. Each of the plants mentioned possesses varying and distinct features well designed to help the general plan.

Other species of marine plants have their uses too. The River Mangrove, *Aegiceras majus*, which does not confine itself to rivers, helps to sweeten the noisome exhalation of the mud, and with its profuse, white, orange-scented flowers, invite the



Avicennia officinalis (White Mangrove)

cheerful presence of bees and butterflies. The "Looking-glass Tree," *Heritiera littoralis*, with its large oval, glossy, silver-backed leaves and boat-shaped fruit, stands with the River Mangrove along the margin farthest from the sea to perform the function of making the locality more acceptable to the

presence of plants which luxuriate in sweetness and solid ground. Another denizen of the partially reclaimed area of the mangrove swamp is the Milky Mangrove or River Poison Tree, *Excoecaria Agallocha*.

Of the timber and bark values of the mangroves, it may be stated that, when large enough, the light but tough white wood of *Avicennia officinalis* is useful for the knees of boats and for waterworks and underground purposes, being of great strength, hardness, and durability in water, and as it does not split radially the aborigines use it for making spears; it has very thin bark which has some value for tanning. *Ceriops Candolleana* has a reddish, hard timber useful for the same purposes, and for house-posts (weighing 63 lb. to the cubic foot when dry), and a bark yielding 20 to 32 per cent. of tanning. *Heritiera littoralis* has a firm, close-grained, durable, extremely tough timber of a dark colour and resistant to white ants. *Rhizophora mucronata* has a valuable bark which yields 28 to 40 per cent. of tannin, and a blood-red sap which has dyeing qualities. Its wood is red in the sapwood and dark-red in the heartwood, and is tough, durable, and close-grained, weighing 70 lb. per cubic foot.

OTHER FAMILY GROUPS

Further grouping in their families might be made, as for instance, the *Leguminosae*, which are *Acacia*, *Adenanthera*, *Albizzia*, *Barklya*, *Bauhinia*, *Cassia*, *Castanospermum*, and *Erythrina*:

the *Euphorbiaceae* are *Aleurites*, *Antidesma*, *Baloghia*, *Beyeria*, *Bridelia*, *Claoxylon*, *Excoecaria*, *Hemicyclia*, *Homolanthus*.

the *Proteaceae* are *Banksia*, *Buckinghamia*, *Grevillea*, *Hakea*, *Macadamia*, *Stenocarpus*, and *Telopea*;

the *Sapindaceae* includes *Alectryon*, *Akamia*, *Atalaya*, *Cupania*, *Harpullia*, *Nephelium*, *Ratonia*;

that of *Saxifragaceae* consists of *Aphanopetalum*, *Anopterus*, *Callicoma*, *Ceretopetalum*, *Davidsonia*, *Quintinia*, *Weinmannia*;

the *Pittosporaceae* are *Pittosporum*, and *Hymenosporum*; and the *Santalaceae* are *Exorcarpus*, *Fusanus*, and *Santalum*.

OTHER AUSTRALIAN TREES

In Alphabetical Order

ACKAMA

(An anagram of the aboriginal name Maka-Maka)

Besides the two Australian species, which are endemic, one other species is found in New Zealand.

Ackama Muelleri (after Baron von Mueller) : The Brush Corkwood of the forests of the mountain ranges on the coasts of New South Wales and Queensland, is a slim tree about 40 feet in height, with corky bark, very small and numerous white flowers clustered on many stalks, the leaves being 5 to 6 inches long and even more, and opposite pinnate with serrated edges. Its timber is similar to *Eucryphia Moorei* in texture, and chocolate-coloured with purplish cast, light in weight, close-grained, but not strong. It dresses well, has a small, neat figure and is free from knots, and best suited for indoor work.

Ackama paniculata (flowers in panicles), is known as Rose-leaf Marara because it is closely allied to Marara, also Rose Alder, and is commonly known in New South Wales as Corkwood.

ACRONYCHIA

(Hooked tips of petals)

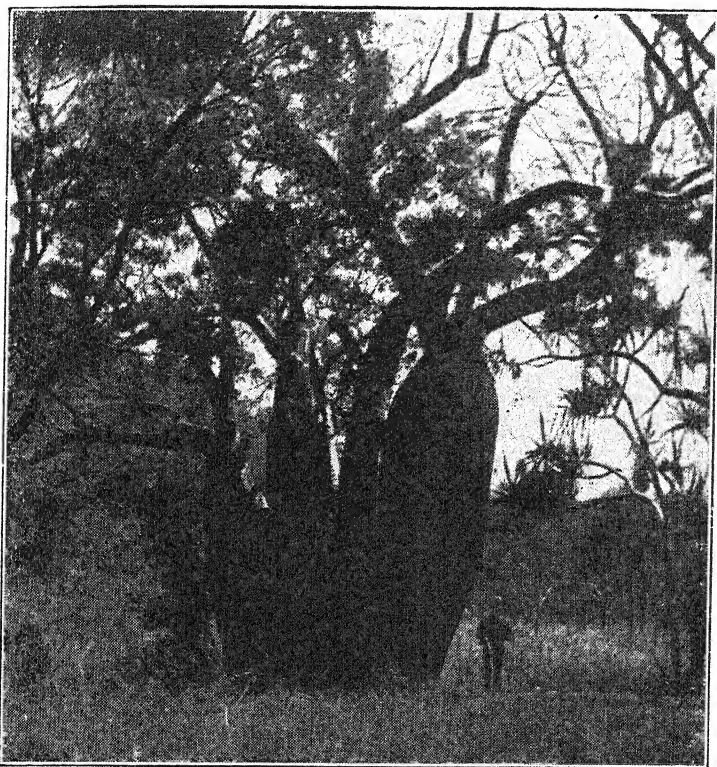
A genus which extends over tropical Asia and the islands of the South Pacific to New Zealand. Of the Australian species, one is found also in New Caledonia, the six others are endemic.

Acronychia acidulata (acid fruit), known as the Logan Apple, with large leaves, 5 to 8 inches long, grows in Queensland (Richmond River to Cairns). The wood is useful for mallet and chisel handles.

Acronychia imperforata (referring to the minute oil-dots on the leaves), is a tree 40 to 50 feet high, curiously called Blunt-all Wood as its bright yellow timber is very hard.

Acronychia laevis (smooth fruit), is a tree 40 to 60 feet or even 80 feet high, and native to the three Eastern States. It provides a yellow, hard, straight-grained, dense timber, which is useful where such a wood is required, and for cabinet-work, veneers, turnery and carving.

Acronychia Baueri (after F. Bauer), known as the Scrub Ash and Scrub Yellowwood, grows to 50 or 60 feet in New South Wales and Queensland, and resembles *A. laevis* but has rather longer leaves and the fruit is hard. The wood is excellent for mallet and chisel handles.



E. J. Dunn, photo.

Adansonia Gregorii (Australia Baobab)

ADANSONIA

(After surname Adanson)

A genus of one species.

Adansonia Gregorii (after the explorer, Gregory) : One of the most remarkable of Australian trees and said to be of great antiquity, is that known as the Australian Baobab, also called Bottle Tree, Gouty-Stem or Gourd-Gourd Tree. It belongs to the *Malvaceae*, and is found in Northern Australia, in arid or moist areas, where there are large forests of millions of these trees. It is remarkable for its stout, bottle or barrel shaped trunk, sometimes 60 feet or so in circumference, but not usually more than 30 or 40 feet high; its branches are numerous and wide-spreading in a large tuft at the top of the trunk, and its

thick leaves are shed in winter, its flowers white. The wood is soft, very moist and spongy, and of a fibrous nature, and might be of use in paper-making; its fibres are used by the aborigines to make strong twine for practical or ornamental purposes. The bark, which is watertight, is smooth, thick, and light-gray in colour. The tree exudes a white gum, rather like macaroni, which makes an agreeable drink when diluted with hot water and, when fermented, becomes very intoxicating. In the pits and hollows formed at the bases of the branches there is stored, during the summer months, many gallons (up to 80 in one tree) of good sweet water, which is used by the aborigines, birds and travellers, but is evidently intended naturally as a supply during the dry winter season for the tree's own nourishment. The large seed-cones, which are hairy when young and hard-shelled when mature, about 8 inches in length, contain in a mass of breadly matter (used as food by the aborigines) numerous seeds, about the size of a large pea, which are held to be nutritious.

ADENANTHERA

(Gland on anthers)

A genus of few species, natives of tropical regions; two species are found in Australia.

Adenanthera abrosperma (beautiful seeds) grows to about 40 feet in Queensland and North Australia only, with black, or blue and red, smooth, shiny seeds in a brownish pod 2 to 5 inches long; the leaves about 3 inches long, the branches slightly hairy, and the wood is close grained, heavy, and of a dark-red colour.

Adenanthera pavonina (peacock-blue) grows in the same area as *A. abrosperma* but also in Asia, sometimes reaching 80 feet, and known as Red Sandalwood, though inaccurately. It has a hard and durable dye-wood, rubbing off a red colour, coral-red when freshly cut but turning purplish on exposure.

AKANIA

(Leaves thorny)

A genus of one species, endemic to Australia.

Akania Hillii (after W. Hill), is popularly known as Turnip-wood or Horseradish Tree, on account of the scent of its bark and freshly-cut timber. It grows to 30 or 40 feet, and is found at Moreton Bay and on Pine River, Queensland, also on the Clarence and Richmond Rivers, New South Wales,

abundant in the Dorrigo Forest but not recorded further south than Camden Haven. It has sweet-scented pale-pink flowers in large, dense panicles, and its leaves are rigid, alternate-pinnate, serrated, and up to 3 inches long. The timber is light-coloured, reddish when freshly cut, with an oak-like grain.

ALBIZZIA

(After the noble Italian family of Albizzi)

A genus of about a dozen species in Australia. Of the Australian species, one is widely dispersed over tropical Asia, the others are endemic.

Albizzia pruinosa (powdered), is a beautiful tree of the brushlands of the eastern part of New South Wales and Queensland, to which it is confined, and is 30 to 50 feet high, the leaves oblong, flowers fluffy, pink or white, rarely yellow, in globular heads on longish stalks, the seeds winged. The timber is called Stinkwood from its sour smell when freshly cut, and is light-yellow in colour, brown near the centre, soft and not durable.

Albizzia canescens (hoary), known as "Throw-i-ee" and native to Queensland, is a fine spreading tree, with hairy young shoots and adult foliage more or less hoary with a very minute oppressed pubescence, the pinnae usually two pairs, the common petiole 2 to 4 inches long, each rachis 3 to 6 inches, the leaflets five to eight pairs on the terminal pinnae, very obliquely obovate and unequally narrowed at the base, mostly $\frac{3}{4}$ to 1 inch long, fewer and smaller in the lower pinnae. The flower-heads are small and numerous on short stalks in dense terminal panicles, the pod stipitate, frequently 8 to 10 inches long and 1 to 2 inches broad, the seeds flat, round, along the centre of the pod. The wood, resembling Walnut, is of a dark colour, nicely marked, and suitable for cabinet-work. This species is closely related to *Albizzia procera* and *Albizzia Lebbeck*, differing from the former in the broader flowers and longer stamens, the panicle much more dense, and a broad pod; from the latter in the smaller sessile flowers and broad pod; and from both in the general aspect of the foliage.

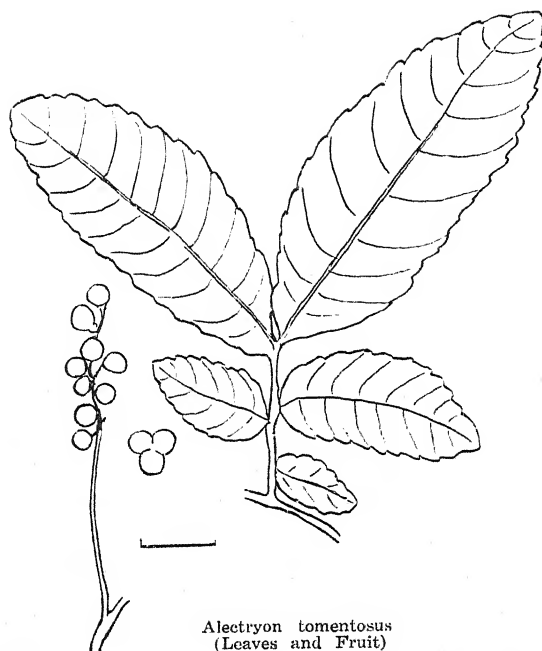
ALECTRYON

(Greek name for the Chanticleer)

A genus of about twenty-five species, mainly in the Indian Archipelago and China, and also extending to New Zealand and Papua. There are about ten species indigenous to Australia.

Alectryon**subcinereus**

(leaves ashy-gray), known as Smooth Ramboutan, of Victoria, New South Wales and Queensland, is a little known tree growing from 50 to 60 feet high. The leaves are firm and entire, pale underneath, and the flowers in panicles. The seeds are black and shiny, enclosed in the arillus. Its wood is close-grained, tough and pale brown, and a cubic foot weighs 50 lb.



Alectryon tomentosus
(Leaves and Fruit)

ALPHITONIA

(Seeds like Pearl Barley)

A genus of six species in Australia.

Alphitonia excelsa (tall), is known as Bushmen's Red Ash, also called Australian Cooper's Wood, and is a native of the open (Eucalypt) forest, widely distributed in the drier inland and east coast areas, and in Central and North Australia, and also found in Asia. The timber is tough but probably a good wood for cabinet-making, being pink-coloured in the sapwood and dark-brown in the heartwood.

Alphitonia Petriei (after A. Petrie). This tree is distinct from the foregoing, to which it is closely allied, and is known as Red or White Ash, White Leaf, or Red Almond. It reaches 140 feet in height, with a 24-in. diameter; otherwise, it has the same qualities, with hard compact bark, which frequently has a whitish covering and when stripped has a strong Sarsaparilla scent. The young branches are covered with short, rusty hairs. Cattle eat the foliage and young shoots, and it is interesting to note that the leaves froth in water probably on account of the presence of saponin. The timber, which is hard and

fairly heavy, is suitable for panelling and decorative furniture; when first cut it is pale, but later the heartwood darkens to red, while the sapwood remains white; the bark is useful for tanning. The genus ranges from Borneo to Hawaii and from the Philippine Islands to Northern New South Wales.

ALSOPHILA

(Grove-loving)

A large tropical and sub-tropical genus of Fern-trees found throughout the world. Of the six Australian species, one is found in Norfolk Island, the others are endemic.

Alsophila Leichhardtiana (after L. Leichhardt), is known as Prickly Fern-tree, with trunk from 15 to 25 feet high, slender, hard and dark, the fronds large-spreading, the spore cases in very distinct series close to the midrib. It is found in the tropical scrubs of New South Wales and Queensland.

ALSTONIA

(After Dr. Alston)

A genus of six species in Australia. One of these is found in tropical Asia, another in Java, but the four others are endemic.

Alstonia constricta (top of the corolla-tube constricted), known as Quinine Tree or Bitter Bark, its very bitter bark having a considerable medicinal value as a tonic and is used as a "bitter" in beer-making; an infusion from it has also been used for dyeing fabrics in various shades of yellow. It is a slender, glabrous tree with a milky juice, with opposite leaves on long stalks, numerous yellowish flowers in cymes, linear fruit 3 to 8 inches long with hairy seeds, and its pale-yellow wood is coarse-grained and warps in drying. This tree makes a good shade and breakwind, and the leaves are sometimes eaten by stock, though rather bitter, but have been found to be injurious to sheep if eaten in quantities.

Alstonia scholaris (wood used for school-boards). This tree grows to 40 feet, native to Queensland, also to Asia and Africa. It is called Milkwood as its wood is white, close-grained, and useful for palings and shingles; its specific name is given because it is used for making school-boards, being light in weight.

Alstonia verticillosa (leaves in whorls), is a good-sized tree, native to Queensland and Northern Australia, with leaves in whorls of four to seven, long and lanceolate. Its wood is light-coloured, soft, and easy to work.

AMOORA

(A Bengalese name)

The genus is spread over tropical Asia and the Indian Archipelago; the Australian species is endemic.

Amoora nitidula (shining) is a tall or medium-sized, glabrous tree, of a genus with one species only in Australia, but about a dozen in Malaysia and India. It is known by bushmen as Incense Wood, and its habitat is the rich, moist brushes of Moreton Bay, Queensland, and the northern rivers of New South Wales, where it grows to 60-80 feet, and occasionally up to 120 feet, with a 6-ft. diameter, and sometimes with an unbranched and straight stem. It has fleshy, smooth and shiny leaves, flowers in panicles, brown pear-shaped fruit with bright-red seeds, and rough, scaly bark, fragrant-smelling; the timber is yellow or pale-coloured, fairly hard and tough, and rather like rosewood, especially in perfume. It may be burnt as incense.

APHANANTHE

(Referring to the obscure flowers)

The genus is limited to a single Australian species, which occurs also in the Philippine Islands.



*Aphananthe
Philippinensis*

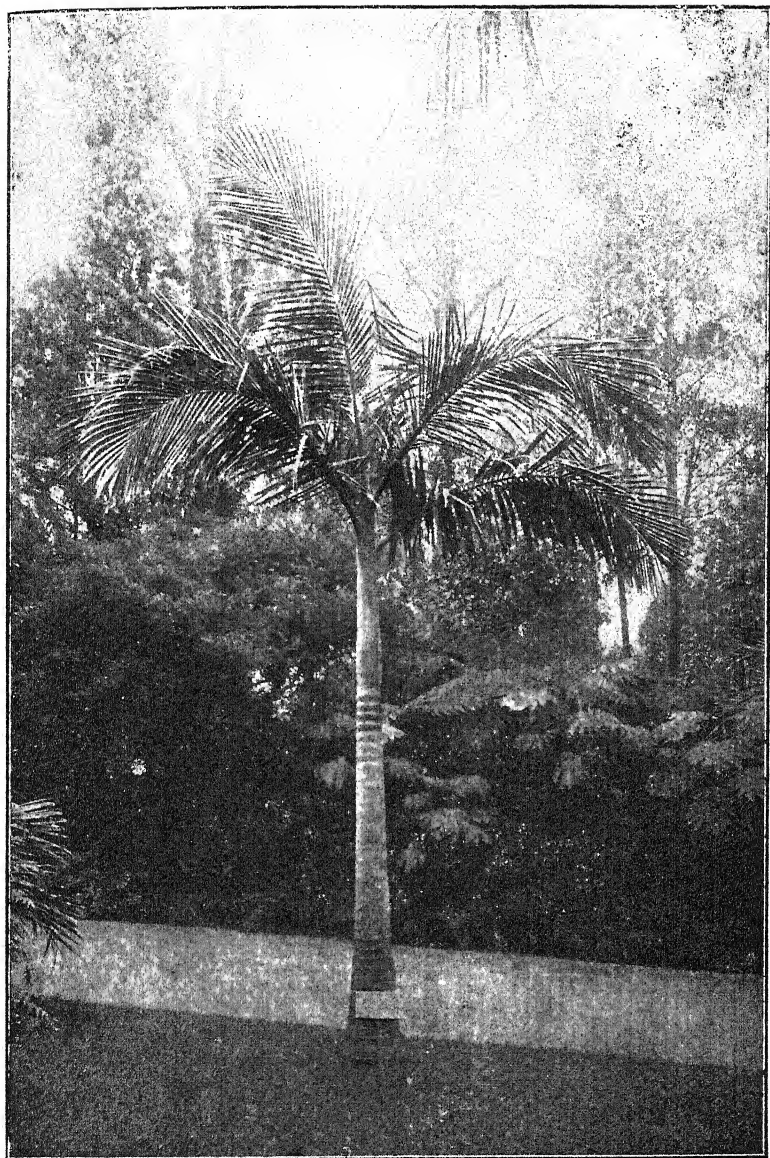
Aphananthe philippinensis (of the Philippines), is known as Elm and Tulipwood, "Mallban" and "Mail," and is indigenous to northern New South Wales and Queensland; a tree 30 to 60 feet high, with a diameter of 15 to 18 inches, the leaves broadly ovate to elliptical, 1 to 2 inches long, but sometimes larger, the male cymes almost sessile but loose, the fruit ovoid, acuminate, about three lines long. The timber is close-grained, light in colour and is useful for linings, ceilings, turnery, etc.

ARCHONTOPHOENIX

(Relationship with the chief date)

A genus of four species of Palms.

Archontophoenix Alexandrae (After Princess Alexandra): A tall palm, growing 70 to 80 feet high, with handsome leaves several feet in length, and rachis very broad and thick; the segments are numerous, often 2 feet in length and an



W. R. Guilfoyle, photo.

Archontophoenix alexandrae Palm

inch broad. It has an ovoid-globular fruit, about six lines in diameter. It occurs in many tropical localities on the eastern coast of Queensland. The wood is beautifully marked and is much in favour for walking-sticks.

ATALAYA

(Indian Name)

The genus is endemic in Australia, with the exception of one species which extends to Timor.

Atalaya hemiglauca (half glaucous), known as White Wood and Cattle Bush and growing 30 to 60 feet high in northern New South Wales, Queensland, North Australia, North-west Australia, and Northern and Central South Australia, is quite glabrous except the white or pale-coloured flowers in panicles, and more or less glaucous, with scaly bark: its leaves (which are entire or variously lobed when young and pinnate when mature) are eaten by stock in dry seasons but are considered to give horses the "Kimberley disease" and "walk-about disease." Its timber is a most attractive hardwood, yellowish in colour, "boney" to work but polishes well, close-textured with very fine rays. The tree exudes a useful pale gum.

Atalaya multiflora (flowers numerous) is a small tree glabrous except the flowers, with leaflets two to six, ovate or oblong and very obtuse. This tree is comparatively rare.

ATHEROSPERMA

(Seed awned)

To the SASSAFRAS

*Silver Queen whose starry crown
Soft as children sleeping lies
Under leaves and branches brown.
Springtime's rarest, last surprise.*

*At our touch your fragrance falls
Like a voice, clear, sweet and brave,
Telling of cool waterfalls,
Moss and fern, and singing wave.*

Besides the single Australian species, which is endemic, the genus includes one in New Zealand.

Atherosperma moschatum (musk-scented), is the Victorian and Tasmanian Sassafras, growing also in New South Wales and Queensland, and so named on account of the scent of its leaves, branchlets, and bark when broken, which is similar to that of the American Sassafras. It is plentiful in some of the gullies and sheltered places of those States, and grows from 50 to 100 feet high, and is an ornamental tree with hanging branches, serrated or entire, dark-green leaves white on the undersides, about 2 to 3 inches long, and fragrant, creamy-white flowers, very abundant in the Spring. The aromatic bark supplies by infusion a bitter tonic of medicinal value and its wood is a cabinet softwood, weighing 41 to 43 lb. to the cubic foot when seasoned, light but strong, and very suitable for clothes-peg, sash and door work, sounding-boards of musical instruments, shoemakers' lasts, carpenters' bench screws, and whip handles.



Chas. Barrett, photo.

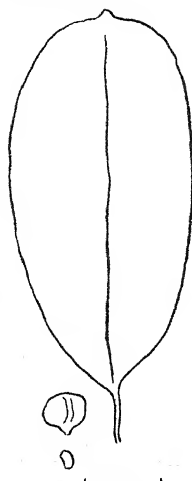
Atherosperma moschatum

Blossoms of the Victorian and Tasmanian Sassafras

BALOGHIA

(After Dr. Joseph Balogh)

The genus contains but few species, chiefly in New Caledonia.



Baloghia lucida
leaf, fruit and seed

Baloghia lucida (shining), is plentiful in the coastal scrubs of New South Wales and Queensland, and is also found in Norfolk Island, Lord Howe Island and New Caledonia. It is called Brush Bloodwood, also Ivory Birch, and is a tree of 40 to 60 feet, with handsome, dark-green, opposite, oval, thick, shiny, fairly large leaves, 2 to 5 inches long, and broad, white or creamy flowers, fairly large. The fruit is a three-lobed capsule of $\frac{3}{4}$ -in. diameter; the knotted, gray bark is stained by the flow of red sap, which at first is colourless, and can be used as a red

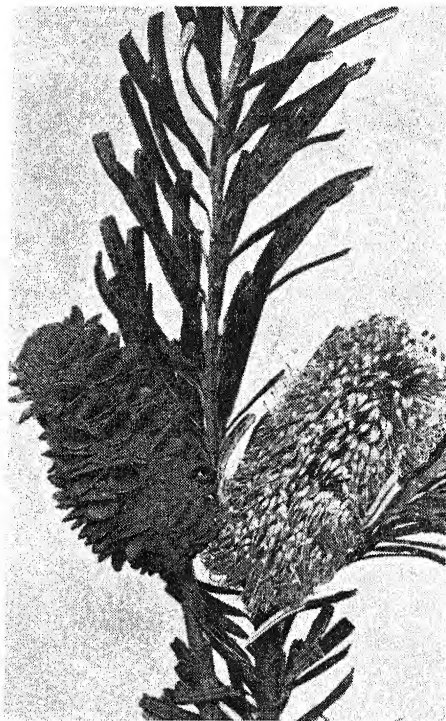
stain for furniture. The moderately hard timber is close-grained, very resinous, yellow, fairly easy to work, polishes well, small-figured, needing careful seasoning, and used for indoor building.

BANKSIA

(After Sir Joseph Banks)

The genus is endemic in Australia.

Inappropriately called Honeysuckle, these trees and shrubs are found in all parts of Australia except the interior, and are



E. E. Pescott, photo.

Leaves, Flower and Fruit of the Honeysuckle (*Banksia marginata*)

plentiful along the coasts, forming valuable shelter-belts that check the sand-drifts. There are forty-six species, most of them native to Western Australia, ten to New South Wales, six to Victoria, only a few being of tree size, from 20 to 40 feet high, and in exceptional cases 50 to 60 feet.

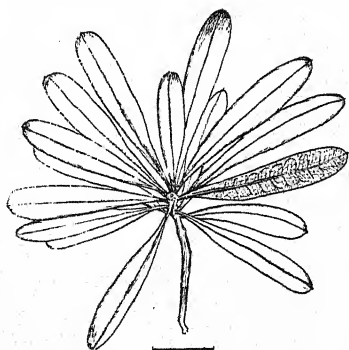
Banksia dentata (toothed): This species is found also in New Guinea. It is slow-growing and has stiff, hard foliage, very much lobed in some cases, but differing in shape in the various species, large, bottle-brush shaped flowers and conical seed-vessels, short, stout, frequently gnarled or twisted stems with thick, very rough bark. It grows on poor soil and withstands exposure. The flowers contain an abundance of honey, strong and high-flavoured, but only suitable for feeding the bees themselves, being too coarse for human consumption.

Banksia collina (growing on low hills), is found along the coastal and Gippsland districts to Queensland, and is an ornamental shrub with broad-linear leaves sharply serrated and white underneath, the shiny, black styles curved inward in the mature flowers and known as Hairpin Honeysuckle.

Banksia ericifolia (heath-leaved): A small tree or shrub in New South Wales, up to 15 or 20 feet in height with dark-green leaves, and flowers yellow to reddish, and when in full bloom they contain a sweet honey-like liquid which is secreted in large quantities.

Banksia grandis (very grand), grows to 40 feet, with the largest blossoms of this genus, yellow in colour, and is native to Western Australia.

Banksia integrifolia (even-edged leaves), is the common coastal tree, 20 to 30 feet high, known as White Honeysuckle,



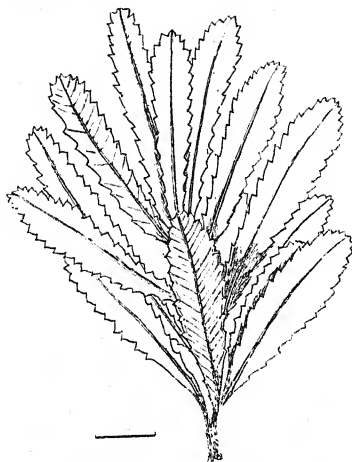
Banksia integrifolia

of the Eastern ranges, and has leaves acute, entire, clustered at ends of branchlets, dark-green above and silvery beneath. It is called Coast Honeysuckle, also Beefwood from the colour and texture of its wood, which is light and strong; considered the most suitable in Australia for aeroplane construction. It is ornamental, very dark-red in colour, with a distinct figure, polishes well, tough and moderately dense, durable indoors but perishable outdoors. It is also

very suitable for decorative work such as panelling, etc.

Banksia marginata (bordered), known as Common Honeysuckle Tree, grows in Victoria, New South Wales, South

Australia and Tasmania, from 15 to 20 feet high, with leaves often recurved at the margin and white underneath, and light-yellowish flowers. Its reddish wood is porous and spongy, but ornamental if carefully dried.



Banksia serrata

Banksia serrata (serrated), is a beautiful tree, so called from the saw-like edges of its oval leaves, which have grayish hair-lets underneath, and known as the Red Honeysuckle on account of the colour of its wood, which is handsome, of a remarkable purplish-red colour, open-grained, and used for boat-building, bullock-yokes, window-frames and turnery; it is light in weight, strong, and does not split with nailing but requires careful seasoning like other *Banksia* timbers.

Banksia verticillata (whorled), the River *Banksia*, is native to West Australia, and is conspicuous for its large, erect, yellow, red, velvety cones. These velvety cones are characteristic of all *Banksias*, and they vary in length from 5 to 10 inches. The flowers are usually bright or dull yellow in colour but in some species pale-pink and deep-red. The timber is much used for furniture.

BARKLYA

(After Sir Henry Barkly)

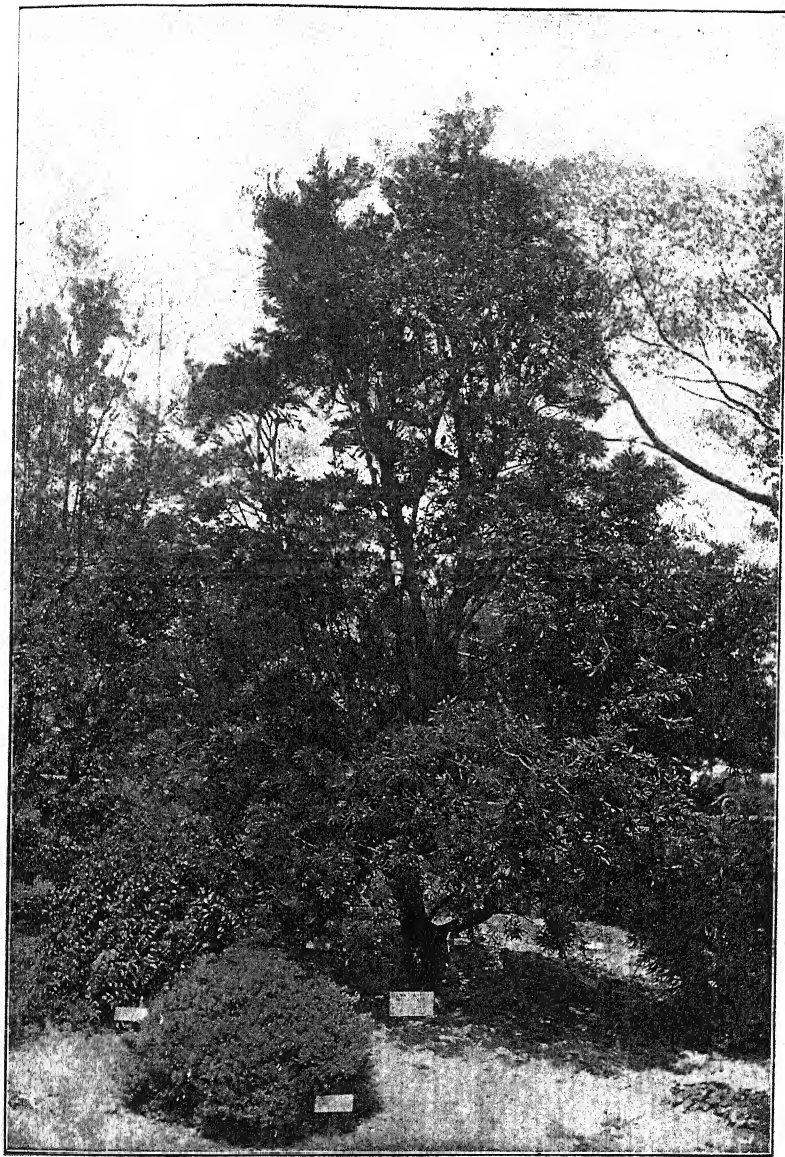
Limited to a single species, endemic in Australia.

Barklya syringifolia (lilac-leaved), known as the Queensland Gold-Blossom Tree, is very beautiful, with its large dense trusses of small bright-orange flowers and alternate heart-shaped leaves, which are dark-coloured, 2 to 4 inches long, the seed-pod being 2 to 3 inches long. It is confined to the coastal districts of Queensland to Rockhampton and not found growing naturally more to the south than the Richmond River, New South Wales. It requires shelter and grows only in rich, moist brushes, but to a height of 40 to 60 feet, its chief value being as an ornamental tree, well worth cultivating as such in northern districts. The dark-gray timber is hard and close-grained.

BAUHINIA

(After Bauhin, a 15th-century botanist)

A large genus distributed over the tropical regions of the Eastern and Western hemispheres. It is the favourite flowering



W. R. Guilfoyle, photo.

Banksia integrifolia (White Honeysuckle)

tree of Queensland, with six species, called Ebony in Queensland, New South Wales, and North and South Australia. These trees are common throughout the more northerly parts of eastern Australia and are deciduous, not very shapely, but occasionally wide-spreading, and the seed-pods resemble strips of new, red leather.

Bauhinia Carronii (after W. Carron), grows 20 to 40 feet in Queensland, New South Wales and South Australia, its wood light-brown, darker towards the centre, hard and heavy, and suitable for cabinet-work. Known as Queensland Ebony, "Penguiny" and "Thalmera."

Bauhinia Hookeri (after Sir W. J. Hooker), is a large tree known as Mountain Ebony, 30 to 40 feet high, with spreading head, usually glabrous, and with large white flowers edged with crimson, in short racemes, and grows in Queensland and North Australia. It has a dark-reddish wood, hard and heavy, which is suitable for veneers.

BEDFORDIA

(after Randolph Bedford)

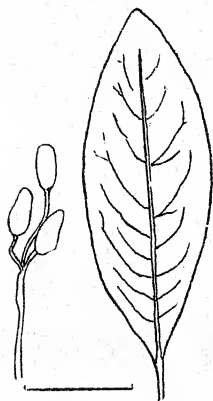
A genus of one species in Australia.

Bedfordia salicina (willow-like), is 20 to 30 feet high, growing in New South Wales, Victoria and Tasmania, and is called Cotton Wood in New South Wales, Blanket-leaf Tree in Victoria and Dogwood in Tasmania. It has lanceolate leaves 3 to 5 inches long, which are hairy or blankety when young, and creamy flowers in small clusters near the stalks. The small timber is pale-brown and well mottled, hard but brittle and difficult to season.

BEILSCHMIEDIA

(after O. S. Beilschmiedius)

Species all tropical, the Australian ones endemic.



Beilschmiedia obtusifolia

Beilschmiedia obtusifolia (obtuse-leaved), is a large tree of the coastal scrub-forests from the Clarence River, New South Wales, to the Daintree River, Queensland, but not common, reaching about 150 feet in height with a 3-foot diameter, the stem sometimes flanged at the base, the bark gray or brown. It is known as Blush Walnut or Hard Bolly Gum and Sassafras. The wood is pale-coloured, close in grain, firm, easy to work, and suitable for joiner's work.

Beilschmiedia elliptica (elliptical leaves): This tree, known as Gray Walnut, is confined to Queensland, reaching 100 feet in height, and 30 inches in diameter, with rather tough brown bark and the young branchlets and flowers hairy, alternate leaves elliptical in outline, 2 to 4 inches long, the flowers bell-shaped, the small fruit globular.

BOMBAX

(raw silk)

The species are chiefly South American, with one in tropical Africa, and another in tropical Asia extending to Australia.

Bombax Malabarica (of Malabar), is known as the Kapok Tree or Malabar Silk-Cotton Tree and is confined to north-western Australia, where it is 40 to 60 feet high, with crimson flowers, an almost smooth bark, and soft, pale wood, its foliage being deciduous. It is not actually endemic to Australia—its specific name of Malabar being used, as it also grows in India; its genus name is derived from a kapok-like substance in its woody seed-pods. Its wood is durable under water.

BOSISTOA

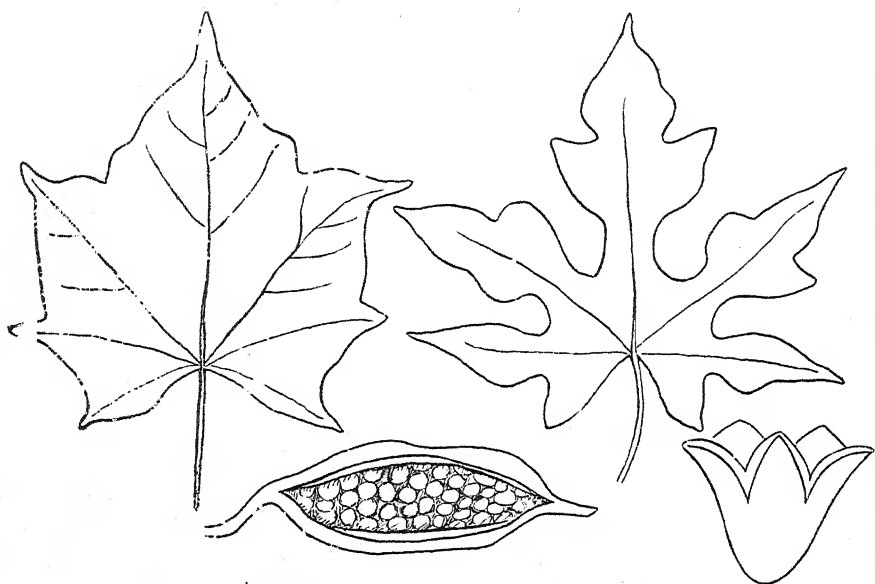
(after Joseph Bosisto)

A genus of three species limited to Australia. They are splendid hardwood brush trees, growing to 40 to 50 feet on the coasts of northern New South Wales and Queensland, providing a good substitute timber for English Box, very hard; it planes to a very smooth surface but is liable to split in drying, and is pale-yellow in colour with hairlike brown streaks, suitable for veneers, brush backs, interior decoration, and also for the very different purposes of making hand-spikes, levers, etc.

Bosistoa sapindiformis (Sapindum-like), is popularly known as Union Nut, and grows in eastern Australia from the Clarence River, New South Wales, to Mackay, Queensland. The young leaves are brilliant red. The timber is close-grained, yellowish, beautifully marked, and suitable for cabinet-work.

Bosistoa euodiformis (well-shaped), is a small tree common on the Macpherson Range, Queensland, and found from there to the Clarence River, New South Wales. The leaves are opposite, consisting of two to five leaflets which are attached at the apex of the leaf-stalk.

Bosistoa transversa (lying crosswise): This tree grows to 50 feet and is found from Eumundi to Maryborough, Queensland. The leaves are opposite, consisting of three leaflets 4 to 5 inches long, and venation is prominent on both surfaces.



Brachychiton discolor
Leaves, Flower and Fruit

BRACHYCHITON

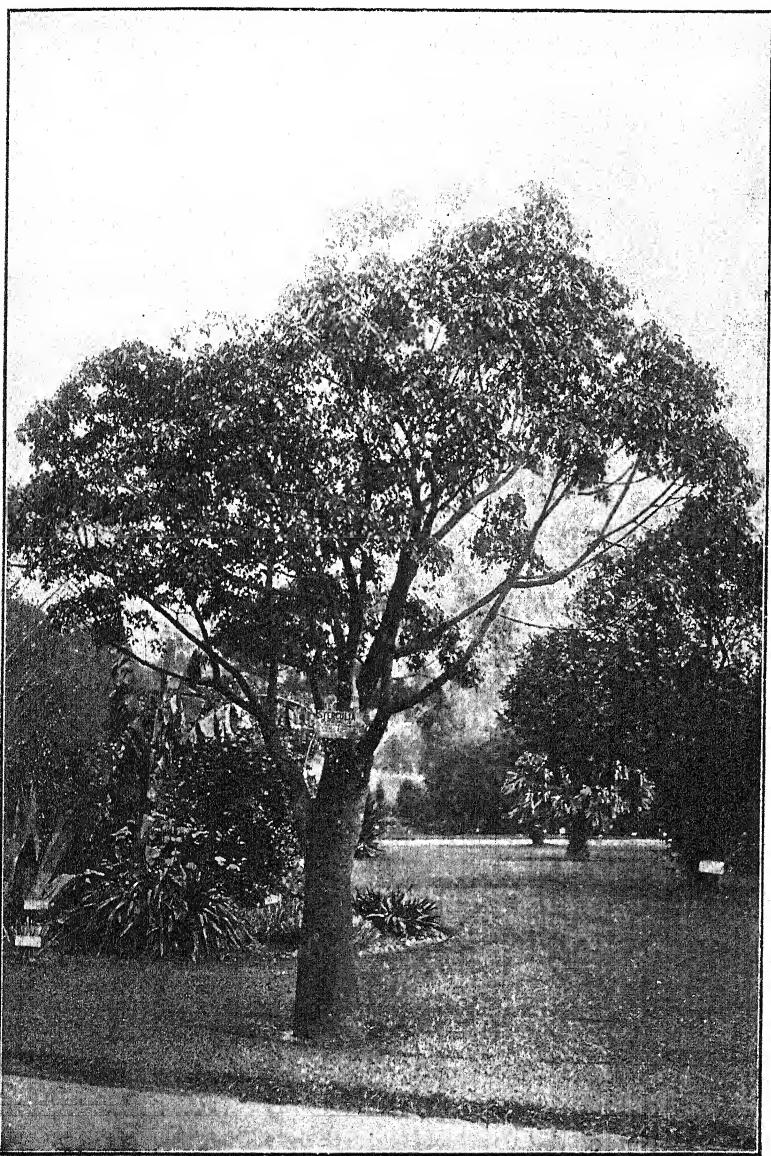
(Bristly seed covering)

THE KURRAJONG

*The passing seasons weave of rainbow shades
Garments for earth, while here and there are set
More slowly grown—the trees. Each Winter's wet
And Summer's sun upon their quiet glades
Makes them more fair, deep-rooted through slow years.*

*Here where old storied oaks were long unknown
They make the young land's beauty all their own—
Kurrajong, Blackwood, Gum. The seasons wane,
Seed-time and harvest paint the changing fields
But still the trees through every year increase
In branch and bloom, in shadowing and peace.*

A large genus, almost entirely tropical, and more abundant in Asia than in Africa or America. The twelve Australian species are all endemic and are important softwood trees, popularly known by the aboriginal name of "Kurrajong" and also

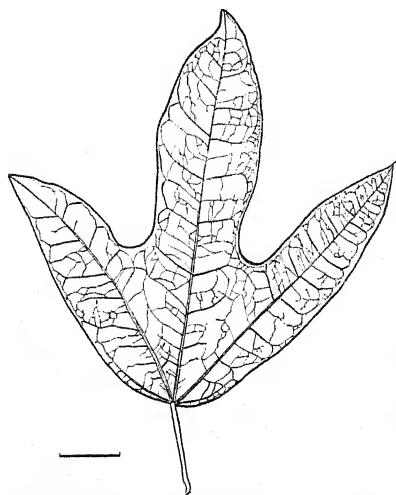


W. R. Guilfoyle, photo.

Brachychiton diversifolius (Kurrajong Tree of N.S.W.)

as Bottle Tree and Flame Tree in some species. They are found in Victoria, New South Wales, Queensland and South Australia. Synonym: *Sterculia*.

Brachychiton acerifolius (maple-leaved), is the New South Wales or Illawarra Flame Tree, also called Lacebark Tree, growing 50 to 60 feet high with a diameter of 3 feet, semi-deciduous, the larger leaves falling in the flowering season. The



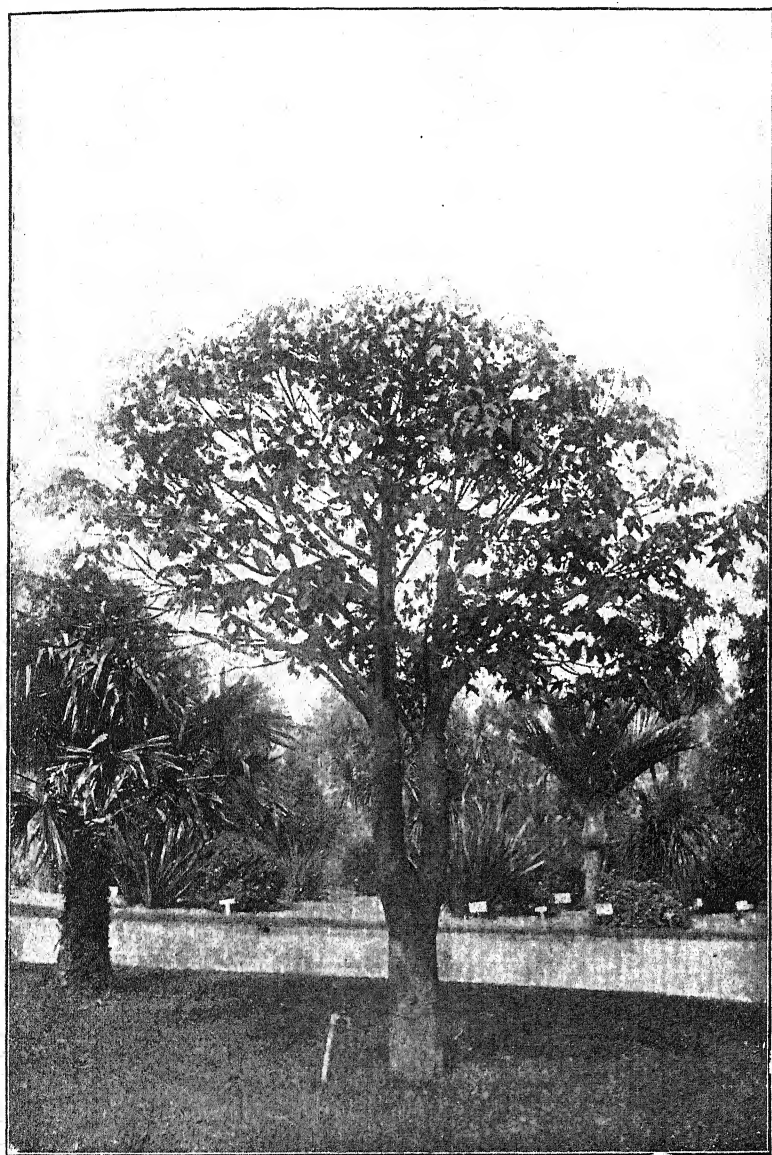
Brachychiton acerifolius

flowers are deep-red, bell-shaped, over $\frac{1}{2}$ inch in diameter, in long loose panicles, making in a favourable season one of the most striking of floral sights. It grows in the coastal brush - forests from Illawarra, New South Wales, to Rockingham Bay, Queensland, and is often cultivated elsewhere as an ornamental tree. The timber is soft, light-coloured, and of light weight. A dye may be obtained from the seed-vessels, which are boat-shaped pods about 4 inches long and contain numerous seeds about $\frac{1}{2}$ inch long in a slightly hairy covering; the bark is grayish

and fissured (fully 2 inches thick in the mature tree) and the fibre furnishes a bast by steeping of a beautiful lace-like texture, which is suitable for making rope and cordage, nets and (when dyed) mats, baskets and summer hats, as it is light and finely perforated when woven, and the tow is elastic and suitable for filling mattresses.

Brachychiton caudata (tailed), grows from 30 to 60 feet in the north-west, with a very straight, branchless trunk of 20 to 40 feet high and 2 feet in diameter; it is almost evergreen and has shiny leaves and small greenish flowers, the timber pale and soft, with a lovely grain.

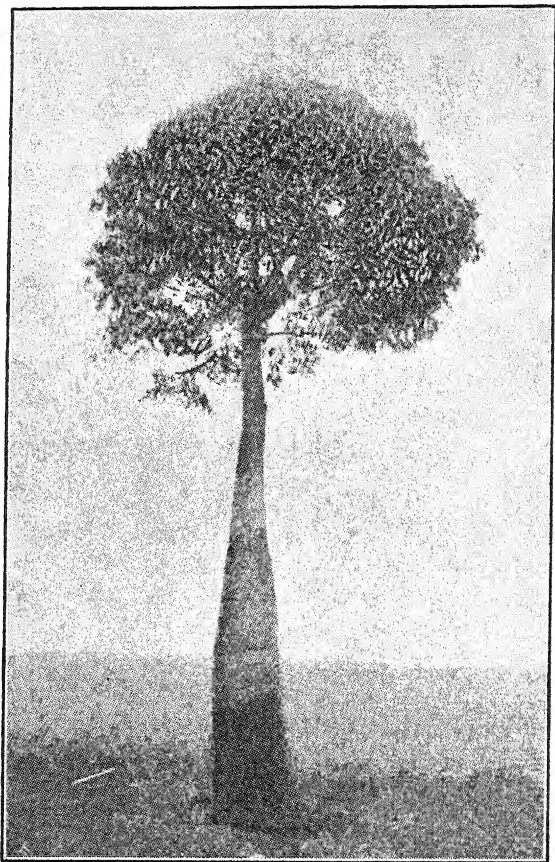
Brachychiton discolor (two-coloured), is a tall evergreen tree scattered through the coastal scrubs of northern New South Wales and Queensland (inland to the Bunya Mountain), and North Australia, also known as Flame Tree and Lacebark Tree, with very broadly heart-shaped and irregularly five to seven-lobed, pale-green leaves, white or paler underneath, partly-coloured rosy-red flowers up to 2 inches long, and a white timber that is soft when cut but dries hard, and is used for shingles; the aborigines use it for shields, as it is extremely light and yet tough.



W. R. Guilfoyle, photo.

Brachychiton luridus (Hat Tree)

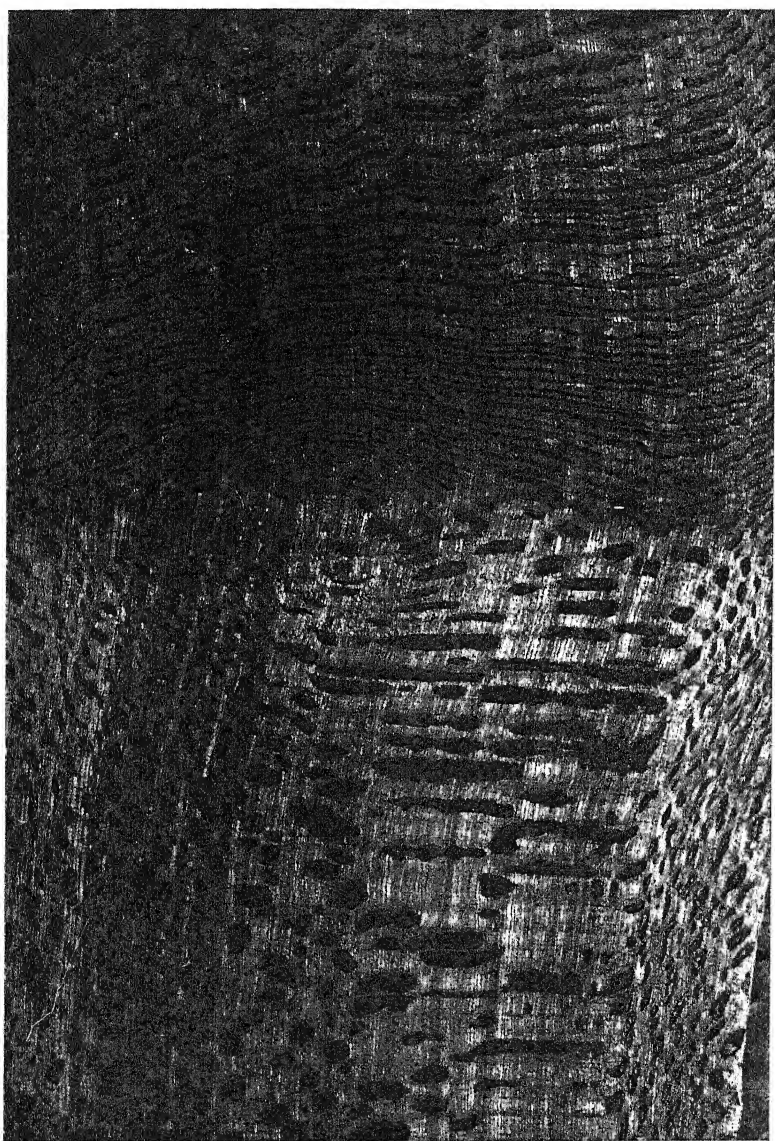
Brachychiton diversifolius (leaves various): A tree 20 to 60 feet high, growing in New South Wales, Queensland, West Australia and North Australia and known in New South Wales as Black Kurrajong or "Currajong." The bell-shaped flowers,



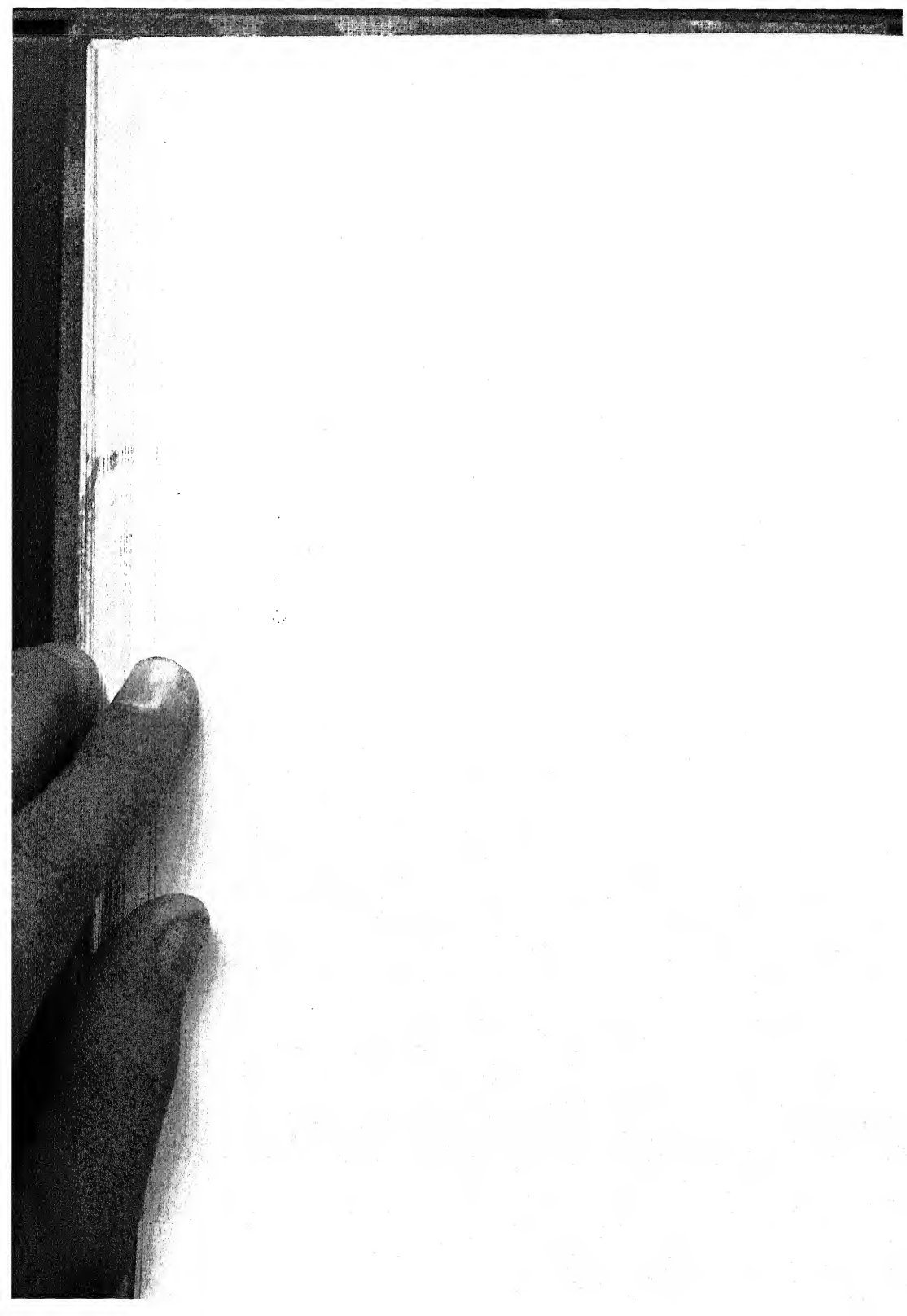
Brachychiton rupestris (Queensland Bottle-tree)

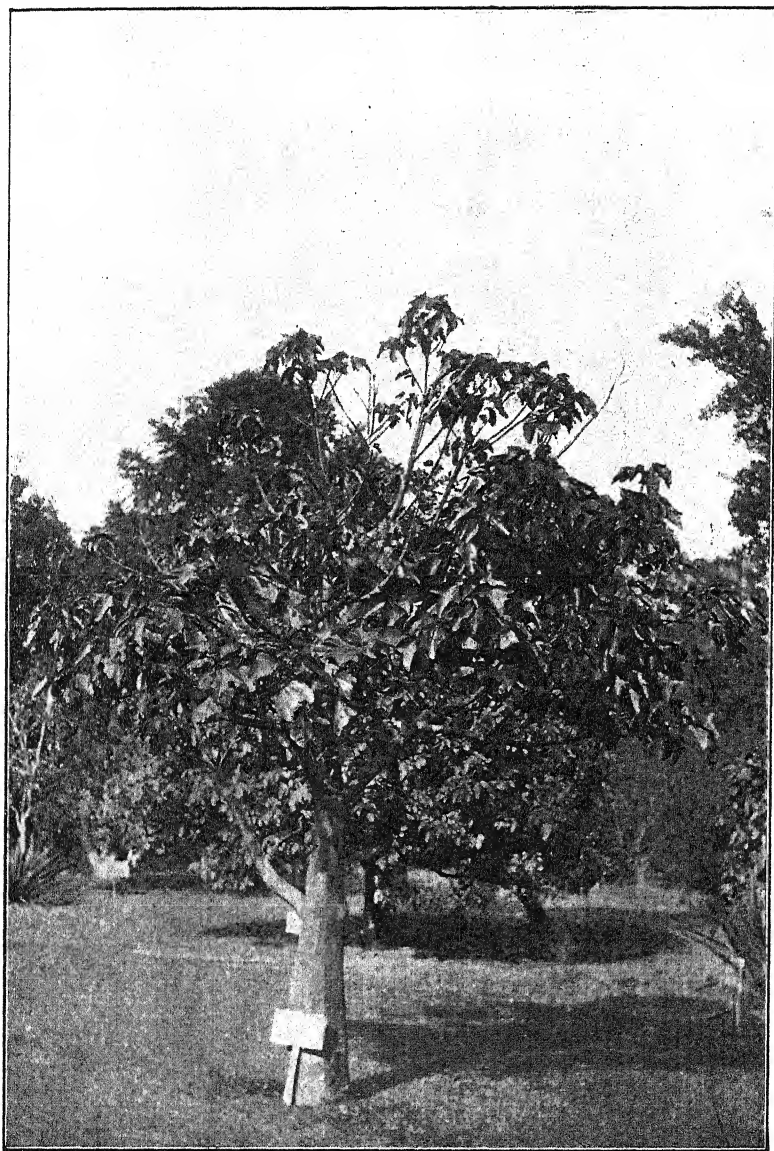
(See page 158)

yellowish-white or mottled with purple, are in axillary panicles, the fruit a follicle up to 3 inches long, and the glabrous leaves very variable in shape, entire or deeply-lobed. The leaves and branches make fodder for sheep and cattle, and the tree affords good shade; the timber is light (about 30 lb.), soft and fibrous, and strong fibre is obtained from the bark.



Banksia integrifolia
(White Honeysuckle)





W. R. Guilfoyle, photo.

Brachychiton trichosiphon (Broad-leaved Flame Tree)

Brachychiton luridus (lurid), known as Hat Tree or Sycamore of Australia, grows to 80 or 100 feet in northern New South Wales and Queensland with a diameter of 3 to 4 feet; the leaves are on long petioles five or seven-lobed, the flowers are like those of *B. discolor* of a livid, variegated colour, and the follicle is large and many-seeded. The timber is light-gray, close-grained, but soft and spongy, and not of any economic value.

Brachychiton ramiflorus (branch flowers): A small tree with nearly round three to five lobed leaves 3 to 5 inches in diameter and sparse, red flowers clustered in the axils of the upper leaves, and follicles stipitate, 3 to 4 inches long, with numerous seeds.

Brachychiton rupestris (growing in rocky places), endemic to Queensland, where it is abundant in the drier scrubs, but not in the rain forests. It is the best known of the Bottle Trees, popularly known as Barrel Tree on account of the barrelled shape of the trunk, which is larger in the centre. It is semi-deciduous and grows to a large size though only 30 to 50 feet high, the diameter of the base being up to 6 feet, and it is crowned by a large, dense head of narrow foliage 2 to 4 inches long. It is remarkable on account of its stem containing a great quantity of sweet, edible juice like jelly, which is wholesome and nutritious. Its fruits are edible, and the soft trunk contains between the inner bark and the tree an abundant supply of water. The soft, pithy interior of the tree as well as the leaves are eaten by stock, the fibre being also useful.

Brachychiton trichosiphon (hairy stamen) is a native to New South Wales and Queensland, and semi-deciduous; it has a somewhat bottle-shaped trunk and is known as Broad-leaved Flame Tree and also Tree of Splendour on account of its rich deep-red flowers. It is sometimes called Rattletrap Tree because of the loud rattling sound made by the very hard seeds in the mature pods when shaken by the wind. Experiments with these seeds have shown that they contain oil of a red colour, clear and like a heavy syrup, with a high saponific value and suitable for making into oilcake. The wood is soft and spongy.

Brachychiton populneus (poplar-like): A glabrous tree 20 to 60 feet high, extending from Victoria to Queensland. The leaves are on long petioles and are ovate to ovate-lanceolate, three or five-lobed, the flowers in axillary panicles; the follicles 2 to 3 inches long on stalks of 1 to 2 inches, the wood soft and close-grained. It is a fodder tree for cattle and sheep in times of drought.

BRASSAEA

(Brassy leaves)

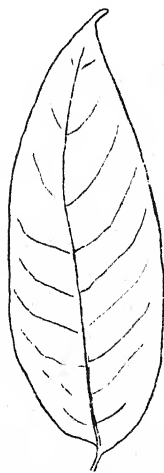
The genus is limited to a single species, endemic to Australia.

Brassaea actinophylla (rayed leaflets), known as the Queensland Umbrella Tree and confined to that State, is a handsome glabrous tree 30 to 40 feet high. It gets its popular name from the fact that its large oblong leaves, 6 inches to 1 foot long, are set like umbrella-ribs at the top of numerous stems. It has a dense head of twelve small red honey-laden flowers, much favoured by birds, and its wood is dark, soft and close-grained, but not durable.

BRIDELIA

(after Prof. Bridel)

The genus extends over the warmer regions of Asia and Africa. Of the three Australian species, one is also Asiatic, the two others are endemic.



Bridelia exaltata

Bridelia exaltata (tall tree) is known as the Spear-poison Tree because it supplies the aborigines with a juice with which they poison their spearheads; they call it "Biggera-biggera." It grows 90 to 100 feet with a 24 to 30-in. diameter, in the coastal scrub of northern New South Wales to Gympie, Queensland. It is also called Brush Ironbark. It has prominently-veined, alternate, ovate-lanceolate leaves, 2 to 4 inches long and somewhat glaucous underneath, which, if eaten, are dangerous to stock, small flowers in clusters, many small rather fleshy, globular berries which are yellow turning to brown, and dark-brown bark prominently fissured. The wood is light-brown, hard and close-grained, somewhat like Walnut, and should be a good cabinet wood.

Bridelia faginea (Beech-like): A small tree found from the Darling Downs to Proserpine, Queensland, and similar to the other species except that its leaves are smaller (up to 2 inches long) and hairy underneath. The wood is grayish-brown and mottled, becoming darker towards the centre, and easily worked and suitable for cabinet-makers.

BUCKINGHAMIA

(after the Duke of Buckingham)

A genus limited to a single species endemic to tropical Australia.

Buckinghamia celsissima (very lofty), is a little-known Queensland tree that grows 60 to 80 feet high and has white flowers in long, terminal racemes, and is known as Ivory Curl-flower; its leaves are entire, lanceolate and 3 to 7 inches long.

BURSARIA

(pouch-like capsules)

*Foam of the sea is no fairer
Than thine is grown;
Scents of the Spring are no rarer,
Where breezes flow
From the far fields of the flowers,
Wattle and Gum,
Mingle their scents for the hours
When shadows come.
Waters are white with thy wonder
Veiling the green
And where their banks break asunder
Thou art between.*

—J.G.

A genus of three species in Australia.

Bursaria incana (hoary young shoots and foliage), known as Box Olive Wood, is a small, erect tree, found mostly on the ranges of southern Queensland, with small, entire leaves hoary underneath, and white flowers in terminal panicles, the wood white or light-coloured.

Bursaria spinosa (spiny), is a small tree, varying considerably in size but sometimes 20 to 30 feet high, and found in all the States, including Tasmania (where it is called the Tasmanian Christmas Tree because it flowers abundantly late in December). It is known on the mainland as Prickly Box (in Victoria), Box-Thorn Olive Wood, but more popularly as Sweet Bursaria on account of its white sweet-scented star-shaped flowers carried in dense panicles late in the season. Its leaves are scattered, generally small, obovate and entire; and it has abundant small brown purse-like seed capsules, contrasting prettily with its bright-green foliage, which is often spiny. It is very hardy and withstands drought. The seed-capsules have a cottony substance inside, and the wood is pale, close-grained, tough, durable under water, seasons and works well.

is very light in weight (only 23 lb. per cubic foot), with a pleasant but fleeting scent; it is small but suitable for tool-handles, etc.

BURSERA

(after J. Bauser)

A genus of one species confined to Queensland.

Bursera australasica (Australian). This tree is confined to Queensland and is known as Carrot-wood, Marrow-bark and Brown Cudgerie. It is a glabrous tree up to 90 feet high with a 24-inch diameter, alternate, pinnate leaves of three to five leaflets, very small deep-red flowers in panicles and oval, purplish, fleshy berries, the bark grayish-brown, the wood gray, close-grained, greasy, easily worked, and does not warp or shrink much in drying, but is only used for inside purposes, such as linings.

CADELLIA

(after F. Cadell)

A genus of two species limited to Australia.

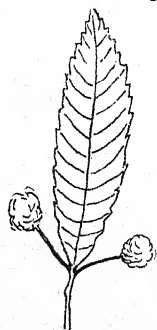
Cadellia monostylis (one style). This tree grows in New South Wales and Queensland up to 100 feet, with ovate-lanceolate leaves and yellow flowers and is known as Yellow-flowered Pyramid Tree. Its wood is of a yellowish colour, resembling some kinds of Walnut and Satin-wood, prettily grained, and would be useful for cabinet-work.

CALLICOMA

(beautiful flower-heads)

A genus of three species endemic to Australia, with yellow flowers, which grow in clusters, their long stamens making them look like hairy balls, consequently rather like wattle-blossoms superficially, growing singly or in pairs on separate stalks, but with the seeds in a capsule, therefore unlike the Acacias in its fruiting. The leaves are deeply-serrated, lanceolate, bright-green and shiny on the upper-side and woolly underneath.

Callicoma serratifolia (leaves serrated): A medium-sized tree, 40 to 60 feet high, growing in the coastal districts of New South Wales and Queensland, generally on the watercourses. It is known as Native Beech or Black Wattle. The leaves are 2 to 5 inches long, with regularly-toothed margins, opposite, densely hairy under-



Callicoma
serratifolia

neath, and the branchlets also rusty hairy; the flowers are small in thick globular heads on long stalks. The timber is one of medium-hardwood class, resembling the English Sycamore or Canadian Maple, of a pale-reddish tint with no particular figure but neat when polished, easy to work and well suited but little used for cabinet-work and coach-building, being usually too small to be considered as a useful timber.

CARDWELLIA

(after E. Cardwell)

Cardwellia sublimis (referring to its comparative loftiness), is a softwood tree called Gold-spangled Wood and Queensland Silky Oak. It grows plentifully in rather inaccessible parts of Central Queensland and in the Atherton Tableland district, attaining a height of 80 or 90 feet. Its leaves are oval or oblong and over a foot long, and the fruit thick and woody, 3 inches long by nearly 1 inch broad. The wood is light-coloured and prettily marked, about sixty per cent. of it figured, and is free from the borer insect; it stands well in drying and has been successfully used for furniture and cabinet-work.

CASSIA

(meaning a plant)

A large genus, widely distributed within the tropical and sub-tropical regions of the world. Of the Australian species many are endemic and number about thirty, growing mostly in the dry interior and only a few on the coast, nearly all yellow-flowered and of a rather hoary character, only one being of tree size.

Cassia Brewsteri (after D. Brewster), is a small tree attaining 30 to 40 feet in height and growing in the drier scrubs, hilly pastures, and on the banks of rivers and creeks of northern New South Wales into Queensland. It is a handsome tree worth cultivating, being notable for its trusses of beautiful flowers, ranging from yellow to orange, and red, resembling Laburnum, and is sometimes called the Queensland Laburnum but more frequently Queensland Cigar Cassia on account of its long, cylindrical seed-pods, which are 8 to 17 inches long and about 1 inch broad; the alternate pinnate leaves up to 2 inches long with leaflets in two or four pairs, and the yellow flowers 3 to 6 inches long in slender racemes. Its wood is pale-pink with yellowish sapwood, close-grained and figureless, its weight about 50 lb. per cubic foot, and useful for general purposes.

Cassia australis (Australian): A rather small shrub with angular branchlets, almost linear leaflets $\frac{1}{2}$ to $\frac{3}{4}$ inch long in several pairs, dark-green above and pale beneath, from linear-lanceolate to oval-elliptical, usually with recurved margins. Flowers two to six in a loose umbel on peduncles usually shorter than the leaves. Seed-pod glabrous, 3 to 4 inches long and about $\frac{1}{2}$ inch broad. It is native to Victoria, New South Wales, Queensland and Northern Australia.

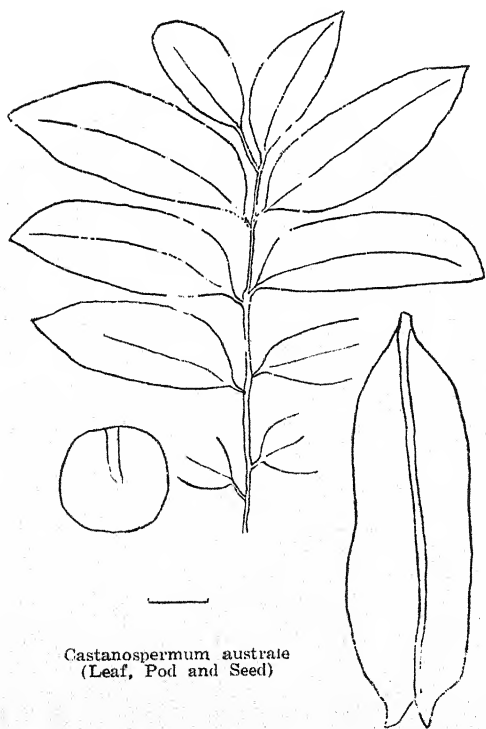
CASTANOSPERMUM

(Chestnut-seeded)

This genus is limited to a single species endemic to Australia.

Castanospermum australe (Australian): A handsome tree called the Australian Bean Tree and Black Bean because of its seed-pods, also Moreton Bay Chestnut as it was first seen there. It is a brush-forest tree generally 80 to 90 feet high

with a diameter of 24 to 36 inches and occasionally 130 feet high with a 4-ft. diameter, growing with a large, dense and compact crown, in the coastal scrubs (or brush-forests) from the Bellinger River, New South Wales, to the tropical and sub-tropical scrubs of Queensland up to Cape York, and as far inland as the Bunya Mountains. It reaches its highest development in the northern districts along forest streams; more southerly it is limited generally to river and creek banks and moist gullies. Its bark varies from gray to brown and it has glossy, dark-green, pinnate



Castanospermum australe
(Leaf, Pod and Seed)

leaves over a foot long and consisting of eight to eleven leaflets each 2 to 5 inches long, and large, yellowish-red flowers rather

like a sweet-pea in form. It has long, large, striking-looking, brown to black seed-pods from 7 to 10 inches long and 2 inches broad, and three to five large, glossy, round or compressed, brown seeds like chestnuts, which are cooked and eaten by the aborigines but are reputed to be poisonous to horses and cattle as they contain saponin. The freshly-cut bark and green branchlets have a strong cucumber smell when crushed. It is a beautifully-figured hardwood of fine, dark, walnut colour with pronounced grain, almost black markings on a light-brown ground, the yellow sapwood being very thick; it ranks high among Australian timbers for cabinet-work, such as particular kinds of furniture, doors, panelling, etc., and is considered in some respects superior to Walnut, the figure being stronger and coarser in some specimens than in others. The sapwood is liable to attack by borer insects; its weight is 47 lb. per cubic foot; the popular name of Black Bean is given to it by timber merchants to distinguish it from the Red Bean Cedar, as it has the same character though of a different colour.

CASTANOSPORA

(Chestnut-coloured seed)

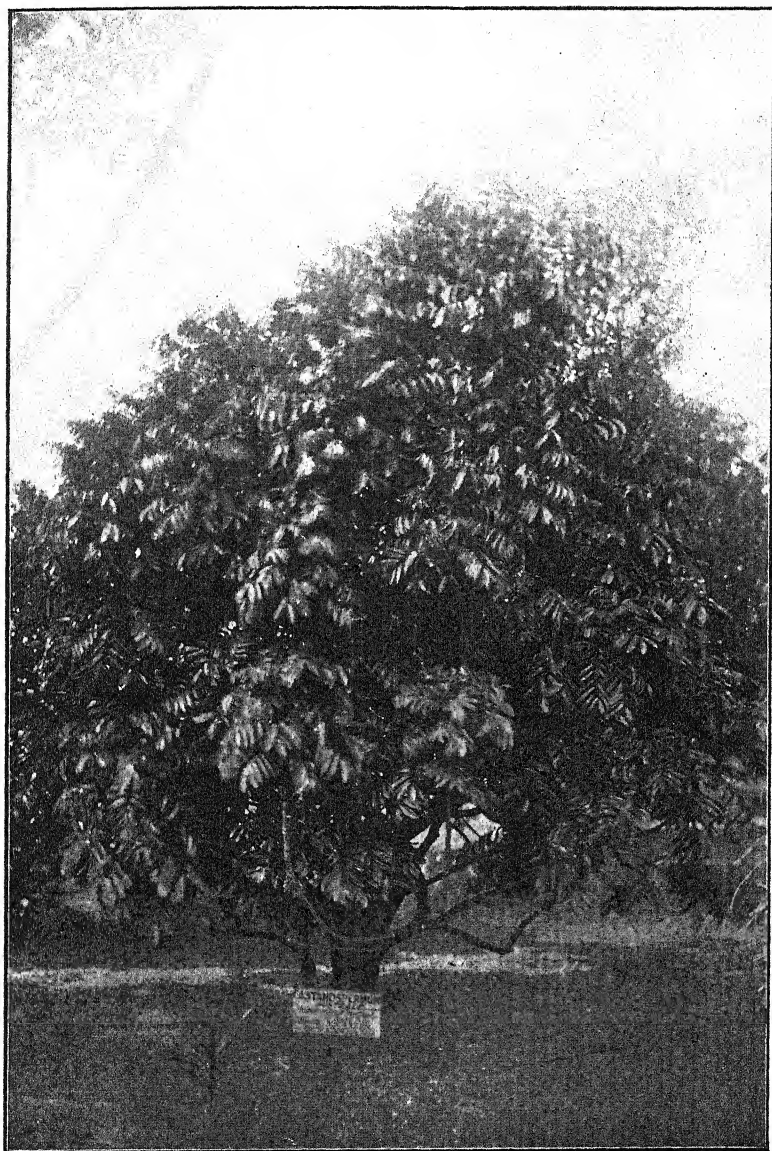
A genus of one species in Australia.

Castanospora Alphandi 30 to 50 feet high, is found in the northern scrubs and on the borders of creeks in tropical Queensland and to a slight extent on the northern coast of New South Wales; it has pinnate leaves of four to ten leaflets 4 to 6 inches long, lanceolate, entire, glabrous, and shiny above, hoary beneath. Its moderately hard, very pale-brown, close-grained timber is a good hardwood for general purposes and would look well in panelling and some kinds of cabinet-work.

CASUARINA

(branchlets resembling the feathers of a Cassowary)

The family consists of a single genus, chiefly Australian, but extending also over tropical Asia from East Africa to the Indian Archipelago and South Pacific Islands. The She-Oaks or She-Okes are strange-looking trees, usually 20, 30 to 150 feet high, but some are small shrubs, found all over Australia, in all kinds of country, from the sea-coast, swampy flats, and river banks to the western scrub-forests and granite ranges, and are very useful in protecting the banks of watercourses with their long, spreading roots. These trees have extraordinarily unique foliage, if such it may be called, for although the leaves are abundant and grow thickly on each twig, they are scarcely leaves but are jointed and grooved branchlets shaped like the trimmed hairs (about 6 inches long or longer) of a horse's



W. R. Guilfoyle, photo.

Castanospermum australe (Black Bean)

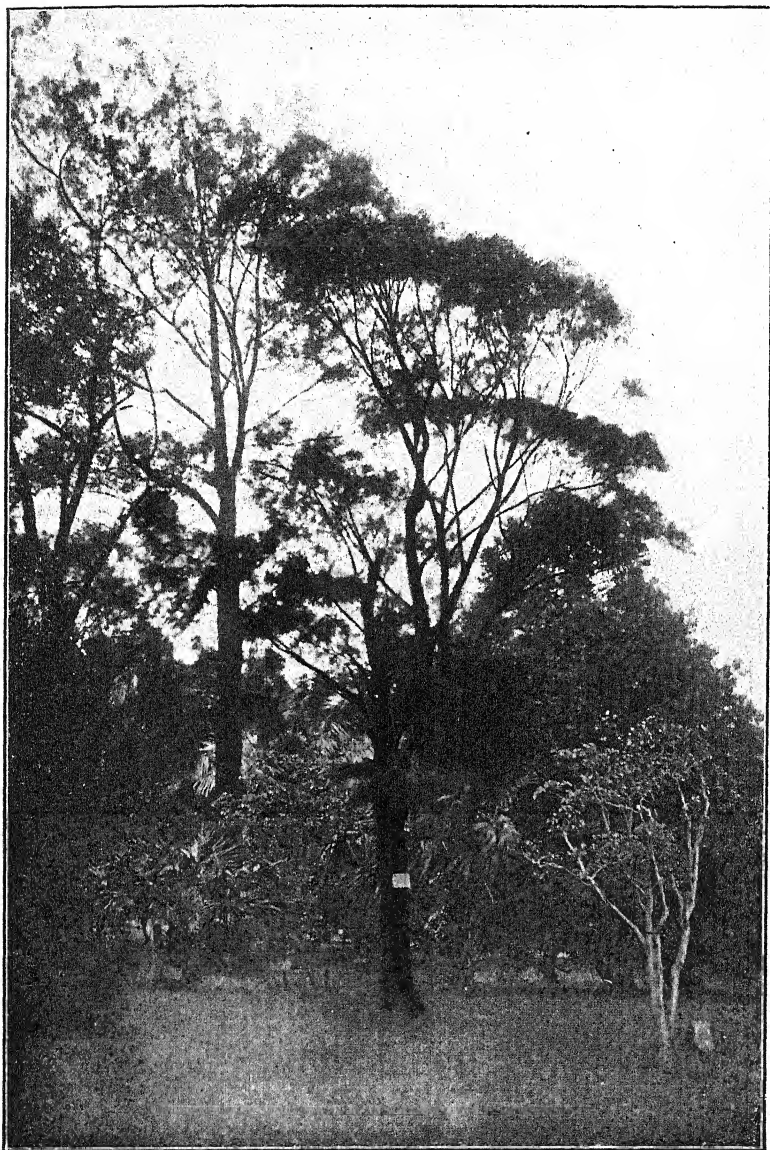
mane, only thicker, hard and wiry like pine-needles but longer and of a dull, grayish-green colour, the actual leaves on them being only minute, pointed scales at each joint, almost invisible to the eye. The flowers are reddish and insignificant but the seed-vessels are usually globular, glabrous cones, varying in the different species from $\frac{1}{2}$ inch diameter to about 1 inch.

Casuarina Cambagei (after R. H. Cambage) is a tree of the interior of Queensland, New South Wales and South Australia, sometimes reaching to 100 feet in height, with cylindrical cones about 12 to 14 inches long and 10 to 12 inches broad, with very prominent valves. The timber of this species is very dark-chocolate in colour, hard and close-grained, without figure, takes a high polish, and is useful for solid work where weight (it is 72 lb. to the cubic foot) and hardness are required.

Casuarina Cunninghamiana (after A. Cunningham), the River Oak or Fire Oak of Queensland, is one of the largest of the genus; some fine specimens grow on the banks of freshwater rivers and creeks in the coastal ranges and central districts of New South Wales and Queensland, though it will grow well in dry areas. It has slender, erect branchlets and cones usually under $\frac{1}{2}$ -in. diameter. The timber is hard, very strong and durable, and 48 lb. in weight, with a close texture, and useful for bullock-yokes, shingles, etc.; its heartwood is pale-chocolate with an almost white outer portion so that it looks well in panelling, heavy furniture, cornice-poles and rings, rods, etc., and it also makes good fuel. The young seedlings are eaten by stock, but She-Oaks generally are not reckoned good fodder, the branchlets being rather too woody and astringent, unless fed with some more succulent foliage.

Casuarina equisetifolia (leaves like a horse-tail): A tree attaining a large size, known as Forest Oak, Shingle Oak or Beefwood, growing in New South Wales, Queensland and North Australia. The bark is hard, rugged and less corky than in other species and may be used as an astringent, as a dye, and for tanning purposes. This species has been planted extensively in South Florida, America, on reclaimed swamp ground, along the roads and avenues and seashores and as wind breaks for orchards, also in the West Indies and tropical parts of North and South America. The timber is coarse-grained, of a dark-reddish colour and prettily marked, with dark veins, works up well, and in some States is considered to be very suitable and attractive in appearance for furniture and small articles such as ornamental boxes, etc.

Casuarina Fraseriana (surname Fraser): The wood of this Western Australian She-Oak, which grows throughout that State and especially in the Albany district, has been used suc-



W. R. Guilfoyle, photo.

Casuarina suberosa (Erect She-oak)

cessfully in the manufacture of pianos, having a certain amount of ring in itself with beauty of grain and taking a high polish.

Casuarina glauca (glaucous), known as swamp Buloke or "Belah," grows in the river swamps of the coast but does



The She-Oak Tree (*Casuarina glauca*)

D. Thompson, photo.

not extend far inland, and in all the States except Western Australia and Tasmania. It is an erect but rather sparse tree with cracked, flaky bark, the branchlets ascending, and cones flat-topped, usually about 40 to 50 feet high but sometimes one of the largest trees of the genus. It is found most plentifully on the coastal ranges and districts of central New South

Wales and Queensland. The timber is oak-like and exceptionally striking in figure, the heartwood pale-chocolate in colour with white sapwood, hard, very strong and durable, 56 lb. in weight, close-grained, takes a good polish, but is brittle and requires care in seasoning; it is used for bullock-yokes (on account of its strength), staves, shingles and rails, and looks well in panelling, cornice-poles, etc., and also makes handsome solid furniture and carves well.

Casuarina inophloia (thready bark), known as Stringy-bark Oak, is a small tree of 20 to 30 feet in height found on sterile, ironstone and gravelly ridges in New South Wales and Queensland, growing sometimes rather crooked and having a beautiful reddish wood with numerous dark marks, very hard and fire-resisting, 66 lb. in weight, and excellent for small cabinet-work but not for fuel.



Casuarina suberosa

Casuarina suberosa (corky), is an ornamental, shady tree found in the mountain ranges and on the coastal districts of the East, growing from 20 to 50 feet, but rarely more than 40 feet, and sometimes attaining a 20-in. diameter. The wood is dark-brown, prettily marked, coarse-grained, hard, tough, useful for bullock-yokes, hurdles, malls, shingles and staves.

Casuarina torulosa (slightly uneven), known in Queensland as Mountain Oak, in New South Wales as Red Oak or Forest Oak, is a small tree not exceeding 50 feet in height

and 18 inches in diameter, with very slender, drooping branches and rough bark. It is not found near water but favours the better-class moist soils. Its short, cylindrical, almost globular cones of $\frac{3}{4}$ -in. diameter are easily distinguishable from those of the other species as the valves are less prominent. The wood is a warm red colour throughout with less well-marked rays of oak-like figure, readily recognised by a peculiarity of its own, and very distinctive for veneers, also used for balusters and any small turnery, walking-sticks and rulers, and very good for shingles, also for fuel.

Casuarina Luehmannii (after J. G. Luehmann), "Buloke" or Bull Oak, growing mainly on river flats in the interior of New South Wales, Queensland and Victoria, is 70 to 80 feet high and rarely 100 feet, and has a clear stem with deeply-furrowed, brittle, easily-stripped bark. The timber is one of the most attractive when polished, the medullary rays more strongly marked than in any other *Casuarina* timber, very hard, heavy (74 lb.) and close-grained, an excellent cabinet-wood, also used for heavy waggon parts; the heartwood is deep-red and the sapwood shaded to palish pink, lovely when cut on the transverse.

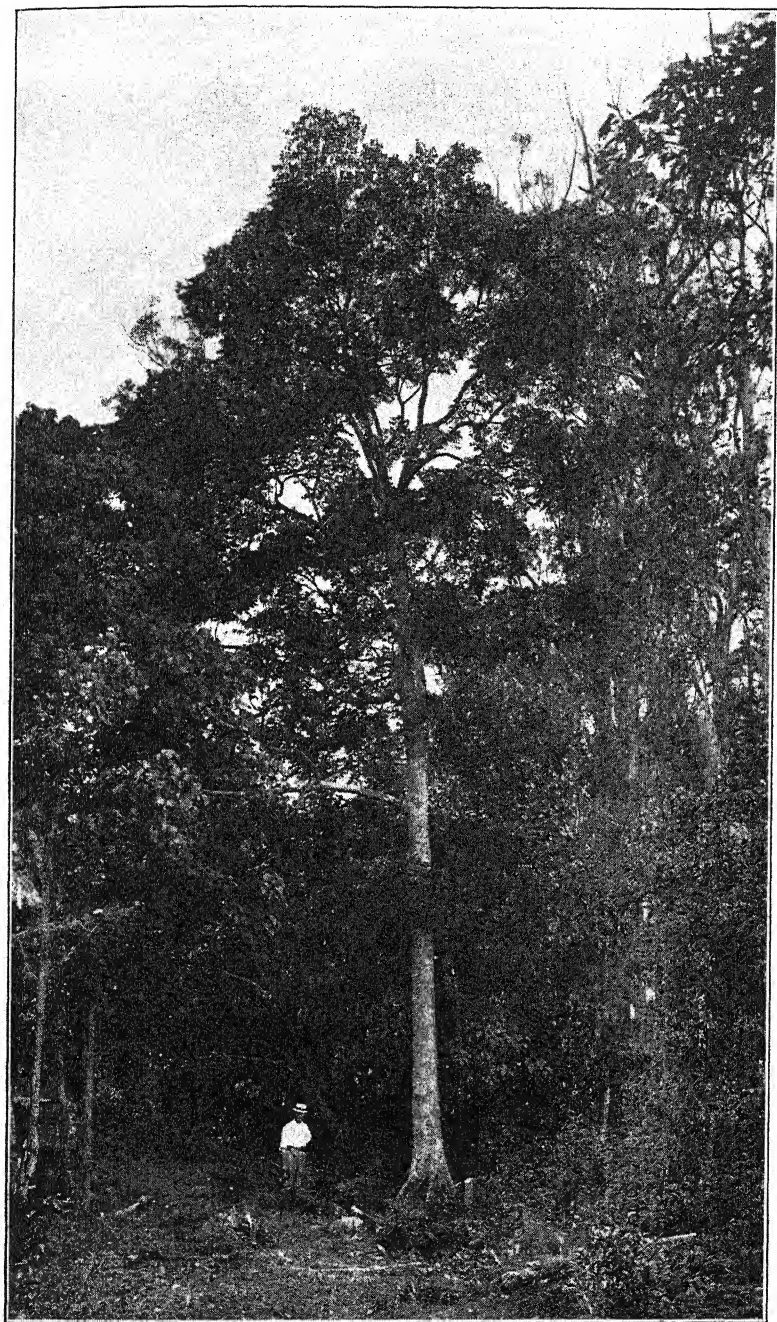
Casuarina stricta (erect), the Mountain Oak or Drooping She-Oak, a small tree of 20 to 30 feet growing on dry and even rocky soil but not in open country, in the interior of all the eastern States. The pendulous, prominently-ribbed branchlets are acid to the taste and are a food for cows and useful for stock generally. The cones are of 1-in. diameter with protruding valves. The wood is reddish, very hard and tough, 62 lb. weight, but not durable; the dark bands running through the grain give the polished wood a fine, mottled appearance which is pleasing for furniture. The wood is also used for turnery, shingles, etc.; and is excellent for firewood and charcoal, as is most *Casuarina* wood—the ashes retaining heat for a long time.

CEDRELA

(The Cedar Tree)

The genus is spread over tropical America and Asia. It is an important one, but represented in Australia by only one species and that is now becoming rare.

Cedrela australis (Australian), is the well-known Red Cedar, very much prized, its timber being now the highest priced in Australia on account of its value and scarcity. It is only found now growing solitary or in small groups in some less accessible scrub-forests of New South Wales and Queensland. This giant, softwood, deciduous tree, one of the very few deciduous trees native to Australia, was once the pride of our north-eastern forests, growing in that portion of Australia from New South Wales to Cape York Peninsula. It is closely related to the Toona Tree of India. It varies considerably in size and shape, its height generally given as from 100 to 180 feet, sometimes 200 feet, and diameters from 36 to 78 inches have been recorded. The trunk is buttressed, the bark gray or brown, scaly, and shed in oblong pieces with a red outer and whitish inner layer; the leaves are alternate, pinnate, consisting of three to eight pairs of leaflets 2 to 4 inches long; the small



N.S.W. Government printer, photo.

Cedrela australis (Red Cedar)

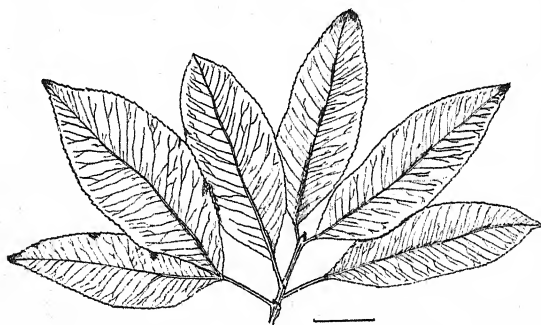
fragrant white or pink flowers are in large panicles at the end of branchlets, and the fruit is a dry, oval capsule about 1 inch long with winged seeds. The fragrant timber is light in weight (only 36 lb. per cubic foot), open in the grain, soft but durable, easily worked and polished, with a long wavy grain often beautifully figured and varying in colour from pink to deep-white, much favoured for furniture and cabinet-work, but often in danger from the cedar twig borer insect. An excellent odoriferous oil may be obtained from it and the tree also yields a small quantity of a transparent pale-amber gum.

CERATOPETALUM

(Petals horn-like)

The genus is limited to three species in Australia.

Ceratopetalum apetalum (no petal) is a straight-growing tree of considerable beauty and fragrance, confined to but common in all the scrubs and mountains of the east coast from



Ceratopetalum apetalum

the Moruya to Richmond River, with almost pure stands of it on the highlands of the Dorrigo. It is called Coachwood in New South Wales and also known as Leatherjacket on account of its shiny, smooth, silvery - white,

hard bark, which is fragrant when crushed. This tree grows to 60 or 70 feet high with a 2 to 3-ft. diameter, and has glossy, dark-green, strongly-veined, opposite leaves usually 6 inches and sometimes 1 foot long and about a third broad. The conspicuous flowers have no petals, but the calyx lobes enlarge and turn red; the fruit is small, dry and two-seeded. The pale-pinkish timber is very tough, fine-grained, fairly light in weight, and can be easily bent to any shape, has a marked figure, takes a good polish and is excellent for cabinet-work and furniture, and largely used for boat and coach building, plank-ing, masts, tool-handles, etc.; it is claimed to be well suited for musical wood-instruments, stethoscopes, etc. Its weight is 42 lb. per cubic foot. A distinctive feature of this wood, which differentiates it from other so-called Coachwoods, is its agreeable odour. It is regarded as a good substitute for English Ash

and not very inferior to American Hickory. This attractive tree is recommended for cultivation in gardens and parks and can be easily grown from seeds.

Ceratopetalum gummiferum (gum-bearing): The New South Wales Christmas Bush, 30 to 50 feet, occasionally growing up to 90 feet high, much favoured as a garden shrub as it has shiny, light-green, rather long, lanceolate leaves and numerous small whitish flowers in terminal panicles, becoming flecked with scarlet and making the tree highly decorative at Christmas-time, hence its popular name, its flower-branches being much used for the season's decorations in that State. It is called in the trade Lightwood, the weight of the seasoned timber being about 40 lb., fine-grained and reddish-coloured. The specific name is derived from the plentiful gummy kino, perfectly transparent, very tough, exceedingly astringent, and of a rich ruby colour, which it exudes when wounded or felled.

Ceratopetalum Virchowii (after Professor R. Virchow), known as Satin Sycamore, grows to 100 feet with a diameter of 2 to 3 feet. The unusual-looking wood is suitable for cabinet-work, and is tough and hard but not durable in the ground; it requires careful seasoning as it twists in drying.

CHRYSOPHYLLUM

(Under-surface of leaves often golden)

The genus is chiefly tropical American. The only Australian one is endemic.

Chrysophyllum pruniferum (plum-bearing), is called Star Apple in Queensland, and also grows on the north coast of New South Wales from the Bellinger River to Rockingham Bay. It is from 30 to 60 feet high with a 12 to 20-in. diameter, but usually a small tree with small clustered flowers, alternate strongly-veined leaves, 4 to 6 inches long and tapering to a point, with russet-coloured hairs on the underside, and small dark-blue globular fruit. The timber is of a uniform pale-yellow colour, and is close-grained, hard and tough, but bends well.

CINNAMOMUM

(An Arabic name for Cinnamon)

The genus extends over tropical and sub-tropical Asia as far as Japan. One of the Australian species is the same as an East Indian one—the two others are endemic.

Cinnamomum Oliveri (after Professor D. Oliver), is a tall glabrous tree known as Oliver's Sassafras, and is 60 to 80 feet

high with a 6 to 8-ft. girth, and has been found up to 130 feet with a 3-ft. diameter. It grows in the dense scrubs of northern New South Wales and southern Queensland, and has glossy, opposite and narrow-lanceolate leaves, 3 to 7 inches long, paler underneath, small flowers in panicles and oval single-seeded berries about 1 inch long. The erect trunk is covered with smoothish, rather thin, brown and rough bark which has a strong fragrance rather like Sassafras. The timber is soft and pale, occasionally a yellowish tint when fresh, and pale-brown when seasoned, fragrant even when old, and suitable for joinery, being firm yet easy to work, but said to be susceptible to the ravages of the borer insects.

Cinnamomum virens (green in colour), is found in the Richmond and Tweed River districts growing about 90 feet high with a 24-in. diameter, but not aromatic; the leaves are of a uniform green on both sides. The wood is close-grained, firm, and has a glossy surface.

Cinnamomum Tamala (Indian name), is a large tree with a smoothish, white bark and opposite leaves, oblong-lanceolate or ovate-lanceolate, from 3 to 6 inches long. It is found in several of the tropical scrubs of Queensland. In India the bark is sold under the name "Taj." The wood is gray, close-grained, firm and strongly scented, its weight 35 to 40 lb. per cubic foot.

COCHLOSPERMUM

(Seeds twisted)

There are four species peculiar to Australia.

Cochlospermum heteronemum (thread-like): A small, deciduous tree from 15 to 30 feet high, of northern New South Wales and Queensland. On account of its bright-yellow, streaked with purple flowers, it is sometimes called Tiger Flower: its usual name of Cotton Tree is derived from the silky fibre that surrounds the seeds. The bark is very tough when young, and the timber very fibrous, soft and white.

CODONOCARPUS

(Bell-shaped fruit)

The genus is limited to Australia.

Codonocarpus australis (southern), known as Bell Fruit, a cone-shaped tree growing to 30 feet in Queensland and northern New South Wales, from Gympie to the Hunter River, having smooth bark and numerous slender, flexuose branches and pale, alternate, lanceolate leaves tapering to a long narrow

point, the bell-shaped fruit nearly an inch long, hanging in pendulous clusters, the wood soft, spongy and valueless.

Codonocarpus cotinifolius (Cotinus-leaved): The Medicine Tree of the interior of all the States but Tasmania, growing 20 to 40 feet high. It is also called Horseradish Tree or Mustard Tree, owing to the taste of the leaves, and Native Poplar because it is graceful and slender. Its leaves are broadly lanceolate and grayish-green, and it is very free-seeding; the bark contains a peculiar, bitter, medicinal property but its taste is quite distinct from quinine, though the tree is sometimes known as Quinine Tree. The timber, which is in much demand, is very light in weight, yellow, soft but durable, strong-smelling and insect-resistant.

CROTON

(Seed resembling a tick)

The genus is a very large one with species extending over the tropical regions of the world.

Croton phebaloides (indumentum phebalium-like), known as Poison Tree, is found in the north-east of Queensland. It is a tree of the coastal districts growing 40 to 50 feet with slender and often pendulous branches which, with the flowers and undersides of the leaves, are hairy, the alternate leaves varying from narrow oblong (when small) to ovate-lanceolate up to 3 inches long, numerous flowers in racemes, and a hairy seed-capsule. The small timber is moderately hard and close-grained, almost white and figureless, 51 lb. in weight, and useful for chair-work.

Croton Verreauxii (after M. Verreaux), is a small, usually glabrous tree with the smaller branches and foliage slightly hairy, the leaves from ovate to lanceolate, usually 2 to 4 inches long but occasionally twice that length. It grows in the northern parts of Queensland, the islands of the Gulf of Carpentaria, and southern coastal districts, being fairly common also in New South Wales. Its timber resembles that of the other species but is softer and lighter (39 lb.).

Croton insularis (first found on South Sea Islands), known as Queensland Cascarilla Bark (its bark being fragrant), is found from the Blue Mountains, N.S.W., to Atherton Tableland, Queensland, and west to Chinchilla. It resembles *C. phebaloides* except that the ovate leaves are in irregular groups and are not so narrow. Its wood is yellowish, close-grained and firm.

CRYPTOCARYA

(Nut hidden)

The genus is chiefly Asiatic, with a few species in South Africa and South America. The nineteen Australian species are endemic.

Cryptocarya australis (Australian), is a small tree known as Gray Sassafras or Moreton Bay Laurel. It has bright-scarlet fruits. Its easily-worked timber is very useful, especially when not exposed to the weather. It is native to New South Wales and Queensland.

Cryptocarya erythroxylon (red wood), known as Southern Maple and Rose Walnut, is a large, straight-growing tree up to 120 feet in height with a diameter of about 4 feet, and with pale-reddish timber. It is found in the scrub forests of the Macpherson Range on both sides of the New South Wales and Queensland border. The timber is red, close-grained and tough.

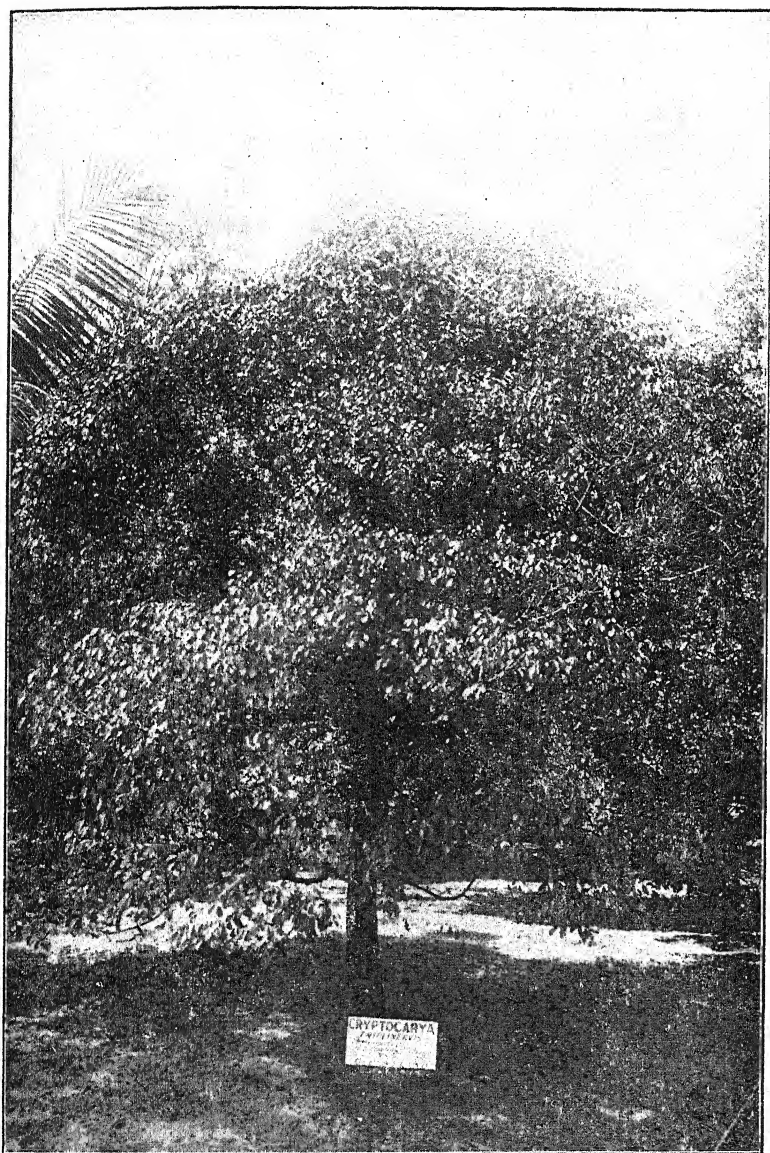
Cryptocarya foetida (strong-smelling): A tree about 90 feet high which has its habitat mainly on the Richmond River, New South Wales. The flowers have an offensive odour but are attractive to bees. The wood is hard and close-grained.

Cryptocarya glaucescens (grayish), known as Black Sassafras, Brown Beech, Brown Pine and Native Laurel, grows from 40 to 80 feet with an 18 to 24-in. diameter. It occurs on the coast of the Dividing Range of New South Wales and the coast of Queensland to Rockingham Bay, also in North Australia. It is a brush-forest tree with round, rather-flattened fruit, smooth bark, straight-grained pale-gray wood, 44 lb. in weight, which has a characteristic figure, and is soft and not very durable but attractive for gray panelling, furniture, or coachwork, and generally useful for indoor work.

Cryptocarya Meissnerii (after C. F. Meissner), a Leather-jacket, is sometimes a tall tree, quite glabrous, growing to 80 and 100 feet in New South Wales and Queensland, with a diameter of 2 to 3 feet, having a white or pale-brown, moderately heavy, tough and close-grained timber which is useful for staves.

Cryptocarya Mackinnoniana (after L. Mackinnon), is a fine tree 100 feet high with leaves oblong or almost ovate, obtuse or shortly acuminate, 4 to 8 inches long, thick and hairy. It is known by the aboriginal name of "Koonjoongaroo." The wood is gray, close-grained and hard.

Cryptocarya microneura (small-veined): A tree over 60 feet high and found from Kiama to Brisbane, Queensland,

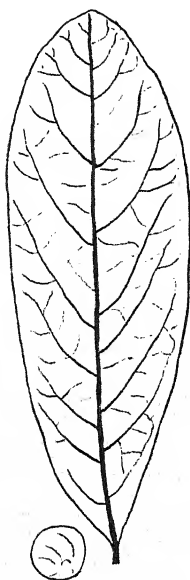


W. R. Guilfoyle, photo.

Cryptocarya triplinervis (Nutmeg Laurel)

distinguished from other species by its rather pointed fruit. The wood is hard and close-grained.

Cryptocarya Murrayi (after J. J. Murray): A large tree of Rockingham Bay, Queensland, with leaves 6 to 10 inches long, its wood dark, hard, and close-grained.



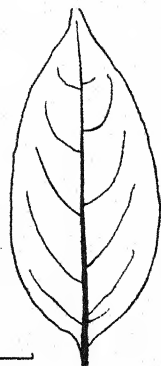
Cryptocarya obovata
(Leaf and Fruit)

Cryptocarya obovata (obovate): A fine bushy-headed tree called White Walnut, Beech and Pepper Berry Tree, growing in the coastal districts of New South Wales and Queensland, and also common in the scrubs from the Tweed River to Gympie, and west to the Bunya Mountains. It grows to 70 or 80 feet high, the underside of the leaves more or less ashy-coloured, and provides an excellent, useful wood which is fairly durable out of doors, easy to work, with a large, wavy, decorative figure of an English Oak tint, the palest timber of this genus, its weight about 51 lb., and useful for general purposes.

Cryptocarya Palmerstonii (after C. Palmerston), known as the Queensland Black Walnut, is fairly common in the north-east, growing to 100 feet, with large black fruits in great abundance, each with one nut, used at one time largely by the aborigines for food. The timber is often resinous, deep-chocolate in colour and, having a fine figure and polishing well, is first-class for joinery and cabinet-work.

Cryptocarya patentinervis (open-nerved): A tall tree growing in the Tweed River district of New South Wales and to the Atherton Tableland, Queensland, supplying an excellent timber of a gray or palish-brown colour, with a slight sheen, tough, close and straight-grained, and of 51 lb. weight.

Cryptocarya triplinervis (3-nerved) is a tall tree with ovate-elliptical or oblong-lanceolate leaves about 3 inches long, triplinerved or more or less irregular penninerved with two or five primary veins on each side of the midrib. The wood is gray, close-grained and tough. It is found in the Richmond and Clarence River district of New South Wales and the east coast of Queensland.



Cryptocarya patentinervis

CUPANIA

(After F. F. Cupani)

A large genus extending throughout the tropical regions. The Australian species are all endemic and found in the north and north-east, all of a comparatively small and slender kind, not more than 40 feet high at most, three species having a good timber suitable for tool-handles and cabinet-work.

Cupania anacardioides (Anacardium-like), is a small tree often found near salt water in Queensland and North Australia, its usual habitat being the scrub-forests from Port Jackson, New South Wales to Townsville, Queensland. It is a shapely and umbrageous tree suitable for parks and gardens, known as Brush Deal or Carrot Wood, growing to 30 feet high with whitish flowers. The timber is pinkish-brown.

Cupania xylocarpa (woody carpel), known as Marsh Hickory and "Wootorie," is a moderate-sized tree native to Queensland. Its timber is of light yellow colour, close-grained, hard, particularly so when dry, resembling European Lancewood.

Cupania tomentilla (tomentose), native to Queensland, a small tree, probably a variety of *Cupania serrata*, with leaflets obovate-oblong, 2 to 3 inches long, flowers nearly sessile in panicles, capsule three-angled, velvety-tomentose and wrinkled. $\frac{3}{4}$ -in. broad.

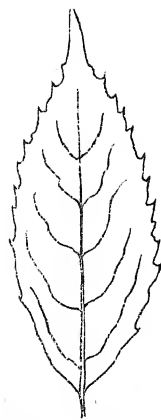
DAPHNANDRA

(Anthers like those of a Daphne)

A genus of four species limited to Australia. They are known as Laurel or Bay Trees and are native to New South Wales and Queensland.

Daphnandra aromatica (aromatic) is a tree of moderate size with sweet, aromatic bark, lanceolate leaves 2 to 6 inches long, often with a narrow-elongated point, and small flowers. It is native to the Johnstone River and other tropical scrubs in Queensland. The wood is light-coloured, not unlike Deal, for which it would form a substitute.

Daphnandra repandula (leaves with undulated margins). This species grows in the tropical scrubs of Queensland and is a moderate-sized tree with hoary young branches and thin leaves 4 to 7 inches long; the transiently-bitter bark is very poisonous, with an extract rich in colourless, pure and crystalline alkaloids. Its timber is considered to resemble that of English Holly and is light-brown, close-grained, and nicely-figured, and suitable for engraving.



*Daphnandra
microtheca*

Daphnandra microtheca (small flowers), is common in the scrub forests of Queensland and as far south as the Hunter River, New South Wales. It is called Light-Yellow Wood, New South Wales Satin-wood, Canary Sassafras, and also Socket Wood (because the joints of the branches often show a ball-and-socket fracture), the name Sassafras referring probably to the fragrance of its pale canary-yellow wood, which retains its colour after being dressed: it is light in weight and easily worked but not durable, polishes well and has a very fine, close, wavy grain, resembling *Doryphora Sassafras* but tougher and heavier: the bark is gray and intensely bitter and used to some extent as a tonic. It is a handsome tree of 50 to 80 feet or even to 120 feet high, and 18 to 24 inches in diameter, the opposite leaves coarsely serrated, and with inconspicuous flowers, the fruit almost cylindrical.

DAVIDSONIA

(After J. E. Davidson)

A genus of one species endemic to Queensland.

Davidsonia pruriens (itching) is a tree 30 to 40 feet high, native to Queensland and known as the Queensland Itch Tree on account of its hairy covering causing that effect when touched, and Davidson's Plum because of its nearly-globular purple fruit, 2½ inches long, which has a sharp acid flavour. It has large leaves and the wood is dark-coloured, close-grained, hard and tough.

DICKSONIA

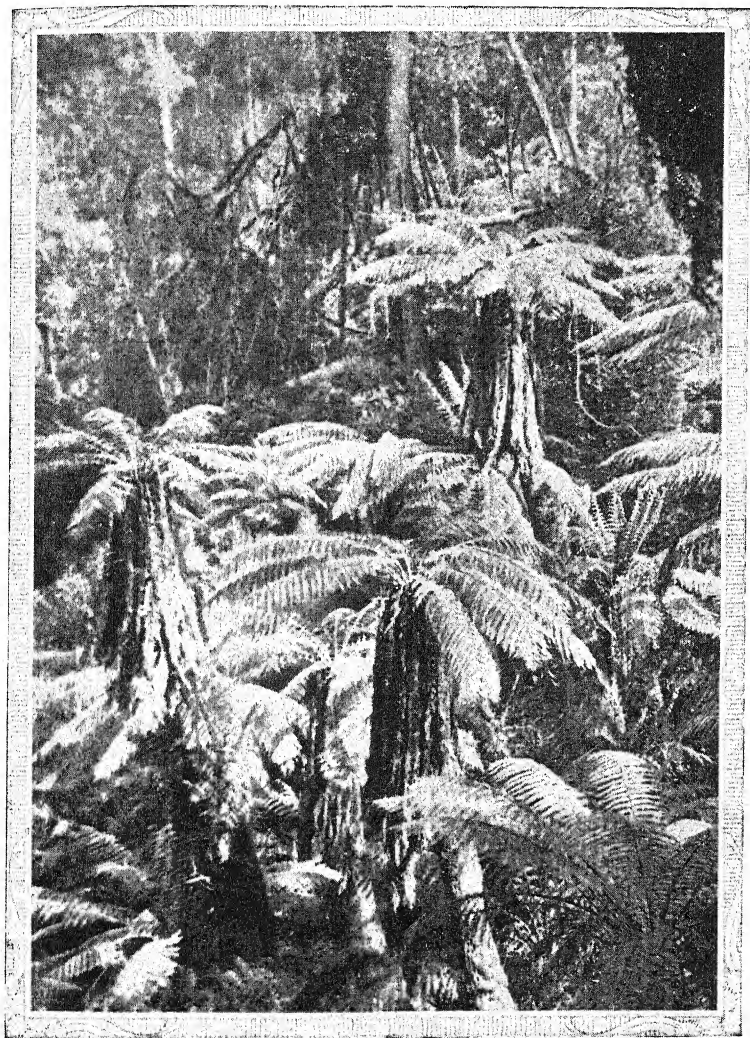
(After James Dickson)

"They did of solace treat,
And bathe in pleasure of the joyous shade,
Which sheltered them against the broiling heat,
And with green bough decked the gloomy glade."
—Spencer.

The genus extends over the tropical and sub-tropical regions of the globe. Of the three Australian species one extends to New Zealand, another to Norfolk Island, the third is endemic.

Dicksonia antarctica (antarctic), known as Soft Fern-Tree, is abundant in subalpine forests and found in all the

States except Western Australia. It attains a height of 50 feet, the fronds are 6 to 12 feet long, pinnate and often thrice compound, the sori solitary on each lobe, the indusium globular



Fern-Trees in Sherbrooke Gully, Victoria.

about $\frac{1}{2}$ -line diameter. The stem is usually under a foot in diameter but may broaden to as much as 4 feet at the base. The wood or outer part of the stem is black, streaked with white.

DIOSPYROS

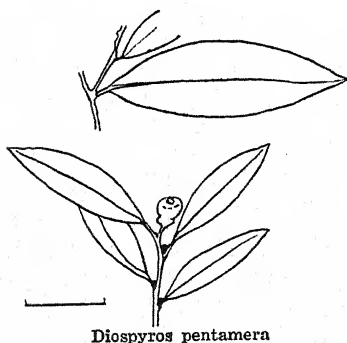
(Divine Fruit)

A genus of six species found in the north-east of Australia.

Diospyros australis (Southern), the Illawarra Black Plum, is a compact, leafy tree, growing 60 to 80 feet high and found between Illawarra, New South Wales and west of Mackay, Queensland. It has alternate, elliptical leaves, round or blunt at the point, thick and shiny and pale-yellow underneath; the fruit is oval and black, up to $\frac{3}{4}$ inch long. The timber is close, very tough and firm, of little beauty and only found useful for whip-handles and other light articles.

Diospyros hebecarpa (fruit hairy) is a tree 30 to 50 feet high, growing on the coasts of New South Wales and Queensland; its timber is not very pleasing, though possessing a good resilience and useful for pick-handles, golf-clubs, etc., the grain straight with black markings and rather numerous small black spots.

Diospyros mabacea (Maba-like): A tree about 20 feet high, its habitat the Tweed River, New South Wales, and coastal scrubs into Queensland. The wood is close, tough and firm, and useful for whip-handles and other light work.

*Diospyros pentamera*

Diospyros pentamera (five parts), known as Myrtle Ebony or Black Myrtle Plum, is a tall tree 80 to 130 feet high with a 2-ft. diameter, growing on the coasts of northern New South Wales and southern Queensland. It has dark, fairly-rough bark. The timber is of a gray colour, soft when fresh but tough and durable and 41 lb. in weight, but is only used for tool-handles and occasionally for flooring-boards

and is not of importance commercially.

DIPLANTHERA

(Double anthers)

The species are few, indigenous to Queensland, also found in Malacca and New Caledonia.

Diplanthera tetraphylla (leaves in whorls of four), is a moderate-sized (about 40 feet high) swamp tree of Central Queensland known as "Gingee," the rough leaves often exceed-

ing 2 feet long by 1 foot broad and the yellow flowers large and growing in a terminal panicle, the timber whitish, firm and close-grained.

DIPLOGLOTTIS

(Double-throated)

The genus is limited to two species endemic in Australia.

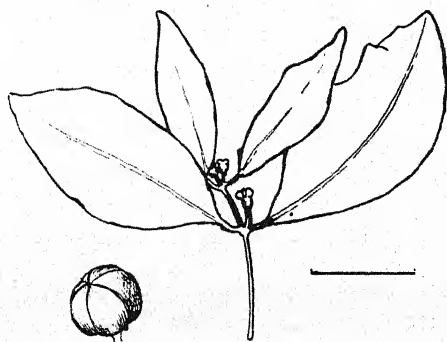
Diploglottis Campbellii (surname Campbell), known as Native Plum of the Tweed River, New South Wales, is a tree of 60 to 80 feet high with a diameter of 2 to 3 feet. It has four to eight leaflets to each leaf, 2 to 4 inches long, the seeds enclosed in a red aril.

Diploglottis Cunninghamii (after A. Cunningham), known as the Rusty-leaved Native Tamarind, is a brush tree sometimes growing to 100 feet with a 24-in. diameter, though usually only about 50 feet, and common in the brush forests of New South Wales and southern Queensland to as far west as the Bunya Mountains. The young branches, leaf-stalks, flowers, and fruits are densely covered with a rusty tomentum, the bark brownish-gray, somewhat scaly, the large pinnate leaves exceeding 2 feet in length and consisting of eight to twelve leaflets 10 inches to 1 foot long, the flowers in large panicles in the leaf-forks, and the amber-coloured, hairy and fleshy fruit sharply but pleasantly flavoured, the seeds covered with orange-red pulp. The timber is usually flesh-coloured, darkening towards the centre, plain, but with a pretty wavy end-grain, firm, hard, and close-grained, dresses well on the face but not on the end-grain, 40 lb. in weight, and excellent for coach-building, also some constructional work.

DISSILIARIA

(Complete bursting of the capsule)

A genus of four species endemic in Australia.



Dissiliaria baloghoides
(Leaves and Fruit)

Dissiliaria baloghoides (Baloghia-like), known as Redheart, Teak or Lancewood, is a smooth tree growing only in the coastal scrubs of Queensland, from Brisbane to Proserpine, near Mackay, and very plentiful near Gympie and in the Sarina district, usually 40 to 60 feet high and occasionally up to 120 feet, the smooth and shiny, ovate-

oblong leaves being 2 to 4 inches long and the fruit red. It has a dark reddish-brown timber, darker towards the centre, close-grained, firm and durable, heavy (73 lb.), with a wavy, slightly interlocked grain, suitable for fencing-posts, wharf and bridge construction, waggons, etc.

Dissiliaria Muelleri (after Baron von Mueller), is a glabrous tree, similar to the foregoing except that the leaves are smaller and serrated, 1 to 3 inches long and broad, on a petiole of about $\frac{1}{4}$ inch, the female flowers are terminal in short cymes, the fruiting pedicels $\frac{1}{4}$ to $\frac{1}{2}$ inch long, the capsule globular found at Rockingham Bay, Queensland.

DORYPHORA

(Spear-bearing)

A genus limited to a single species endemic in Australia.

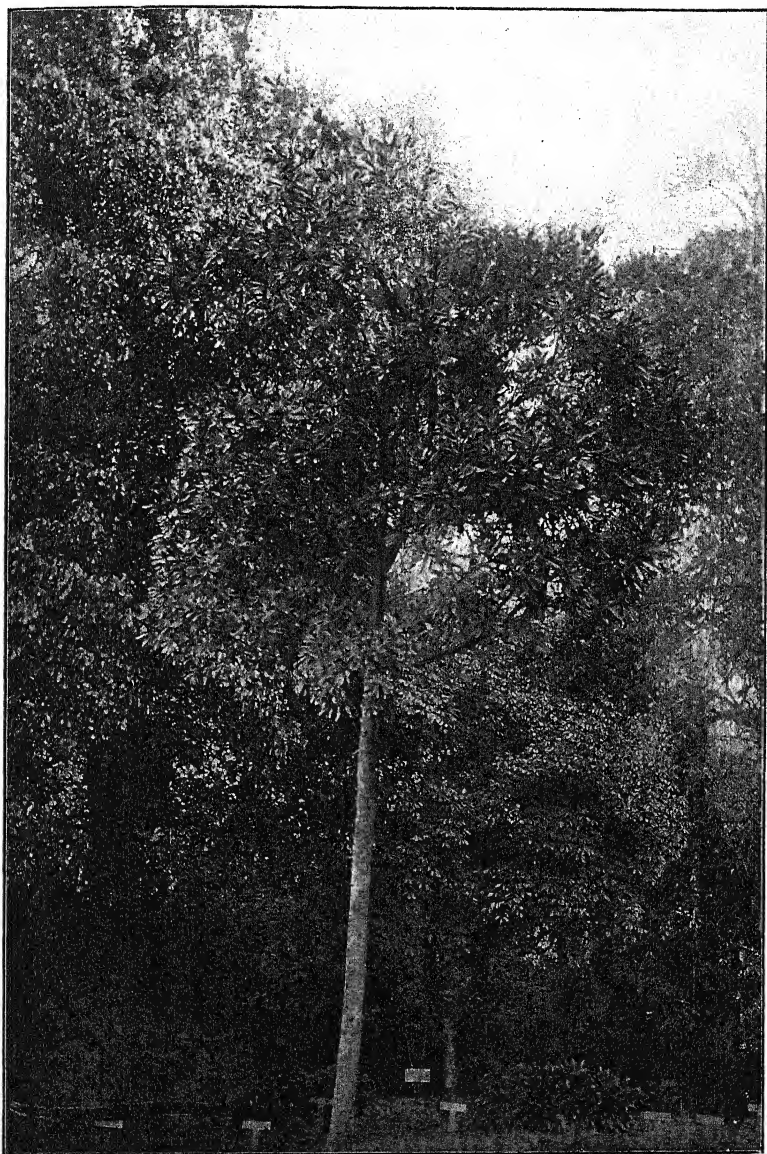
Doryphora Sassafras (Sassafras-like): The fragrant Sassafras Tree of New South Wales and Queensland, found only from the Dromedary Mountains to the Logan River, growing

from 60 to 80 feet, usually with a 2 to 3-ft. diameter but has been found 120 feet high with a 5-ft. diameter. Its star-like white flowers, of about 1-in. diameter, are usually three together on a short panicle; the bright, glossy, oblong-lanceolate, serrated leaves are 2 to 4 inches long, the fruits narrow, ovate, $\frac{1}{2}$ to $\frac{3}{4}$ inches long, open on one side. The bark is



Doryphora Sassafras

used as a tonic in the form of an infusion, and the timber, occasionally known as Golden Deal, is of a Sassafras fragrance, insect-resisting but soft and not durable, light in weight and colour, occasionally with a neat figure, dresses well, but is not of much commercial value except for inside linings, flooring, packing-cases, etc.



W. R. Guilfoyle, photo.

Duboisia myoporoides (Corkwood)

DRIMYS

(Referring to the bitter bark)

A genus of three species in Australia.

Drimys lanceolata (tapering at each end) : The Australian Pepper Tree of Victoria, New South Wales and Tasmania, not to be confused with the more familiar Pepper Tree (*Schinus Molle*) from South America grown so extensively in Australian parks and gardens, which it does not resemble. The Australian tree is found in the mountains and moister and cooler parts, with bright, shiny, long, narrow leaves, greenish-yellow or white but insignificant flowers in clusters, and decorative clusters of black seeds about the size of peppercorns. The leaf-stems and leaf-veins have a distinctive red colouring, especially in the winter, and the leaves are aromatic and of a hot and pungent cinnamon-like flavour, the bark also aromatic. The tree is usually small but is sometimes as high as 30 feet.

DUBOISIA

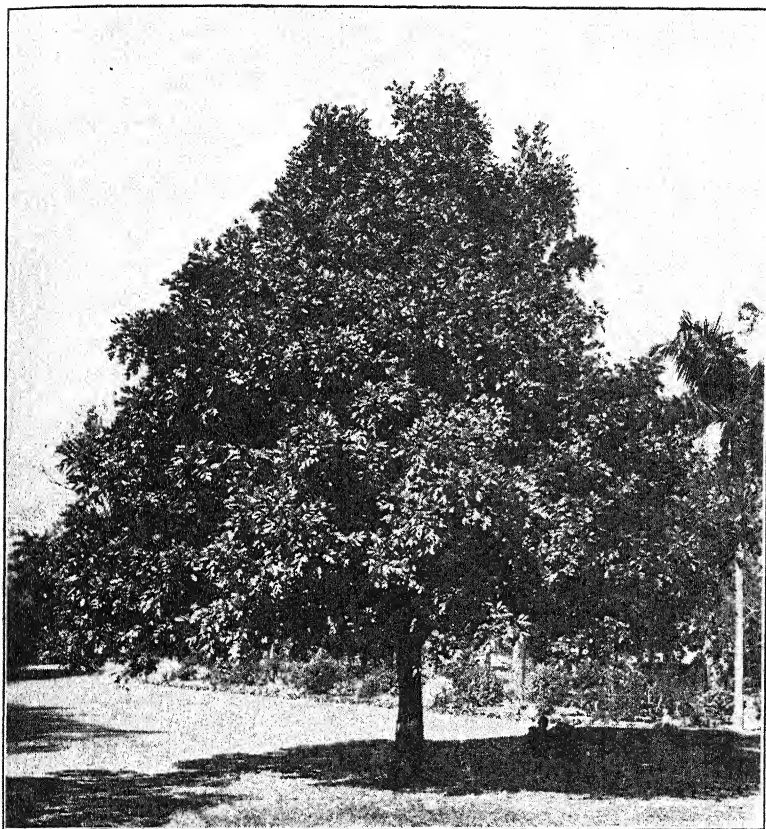
(After Louis Dubois)

The genus is limited to three species, one extending from East Africa to New Caledonia.

Duboisia Hopwoodii (after H. Hopwood) : This small, erect tree is found in the interior of all the States but Victoria and Tasmania. It has narrow leaves, reputed as poisonous to stock, and white or pale-lilac flowers, and is an interesting species on account of the intoxicating effect produced by the mastication of the powdered leaves and twigs; this fact was discovered by the aborigines of Central Queensland, who called it "Pituri" (variously spelt and pronounced as "Pitchery" or "Bedgery") and regarded it as so precious that it was used as an article of barter among them. It has also a stimulating effect, assuaging hunger. With white people it causes a severe headache. The alkaloid it contains is said to be nicotine.

Duboisia myoporoides (*Myoporum*-like), is a glabrous tree which sometimes reaches 40 feet in height with an 8-in. diameter, and alternate, entire leaves 2 to 4 inches long, narrowed at the base, small white flowers with purplish stripes about $\frac{1}{4}$ inch long and bell-shaped. The fruit is a small black globular berry, and the gray bark is corky and rather fissured, hence the tree is known as Corkwood. It grows usually 25 feet high on the foothills of New South Wales and Queensland and also in New Caledonia; its leaves and twigs also possess narcotic properties, containing a valuable alkaloid known as Duboisine, used the same as Atropine. The timber is light, soft but close-grained, and has been used for carving. The tree

may be propagated from seeds or ripened cuttings and is worthy of cultivation for commercial purposes.



N.S.W. Government Printer, photo.

Dysoxylon Muelleri (Red Bean)

DYSOXYLON

(Evil-smelling wood)

A large genus spread over tropical Asia and the Indian Archipelago, extending also to New Zealand. The fourteen Australian species are all endemic and native to New South Wales and Queensland.

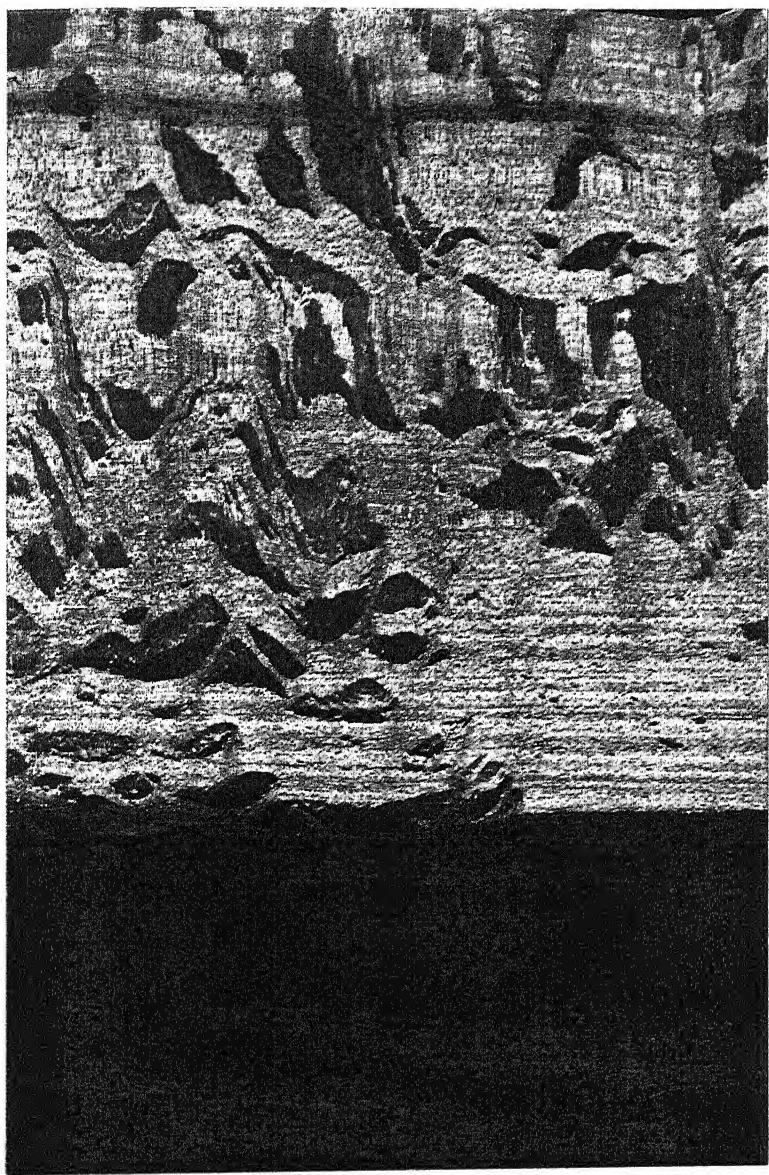
Dysoxylon Becklerianum (after Dr. Beckler), is a small tree found in the Clarence River District, New South Wales, and the southern portions of Queensland.

Dysoxylon Fraseranum (after C. Fraser) is a large brush tree of the north coast of New South Wales and south coast of Queensland, common on the ranges and known as the Apple Tree of Lord Howe Island. It has long lanceolate leaves narrowed at the base, dark-green, and shiny on the upper side and paler beneath, small scented flowers in loose panicles, and fruit resembling a small pear-shaped, hard capsule, rosy-red when ripe. The bark is yellowish, flaky, and fragrant. It is ordinarily 50 to 70 feet high with a 3-ft. diameter but sometimes the tallest tree of the scrub forests it frequents, reaching to 130 feet, and occasionally somewhat flanged at the base. Its timber is the well-known Rosewood, Red Pencilwood or Pencil-Cedar, resembling English Rosewood, with a sweet odour which it retains permanently, despite the name of its genus; it has a good figure, is very durable, and planes and dresses well and easily. It is excellent for cabinet-work, indoor work of all kinds, and is considered a good substitute for Mahogany.

Dysoxylon Muelleri (after Baron von Mueller): One of the large brush trees of the northern rivers of New South Wales and the Queensland coast, 60 to 80 feet high, and sometimes more. It is an ornamental and shady tree, with a timber called Red Bean owing to its red heartwood, the sapwood pale or white, the name being given to it especially by timber-merchants from its resemblance to, and to distinguish it from, Black Bean (*Castanospermum australe*). It is sometimes called Turnip-wood because when freshly cut its timber smells like Swede Turnips and the bark has a similar odour. It has pinnate leaves of eleven to twenty-one leaflets, small flowers in panicles, the fruit a rather rough capsule of about 1-in. diameter. Both this species and *D. Fraseranum* are favoured for furniture, cabinet-making, and interior fittings, owing to the charming red colour and finely marked grain of their wood, and also because it works and polishes well, splitting easily though liable to "sweat"; it is light in weight but fairly hard.

Dysoxylon oppositifolium (opposite-leaved) is a tree endemic to Queensland which has small, prettily marked heartwood and yellow sapwood that is fragrant. The wood is close-grained and easily worked, and used for joinery and cabinet-work.

Dysoxylon rufum (covered with reddish hairs), known as Spurious and Bastard Pencil Cedar, grows to 40 or 50 feet, occasionally to 80 or 100 feet high, and is confined to, but fairly plentiful in, the scrub forests of the northern rivers of New South Wales and southern Queensland. Its timber is also of the Cedar class, pale-coloured, fissile, fairly light, nicely

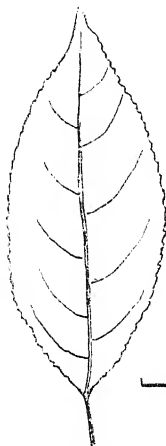


Casuarina glauca
(Swamp Oak)

grained, having an onion odour when fresh. The tree has smooth, grayish bark and may be distinguished by its rather large rusty-hairy capsules.

EHRETIA

(After D. G. Ehret)



Ehretia acuminata

The genus is widely distributed over the tropical regions of the globe. Of the five Australian species, two are common in the East Indies, the three others are endemic.

Ehretia acuminata (leaves acuminate), known as Brown Cedar, and native to Victoria, New South Wales and Queensland, is a small glabrous tree 20 to 30 feet high, the leaves petiolate, oval or elliptical-oblong 3 to 6 inches long, the flowers sessile in dense panicles and crowded on the branchlets, the fruit round, two to six lines diameter. The wood is light-brown, coarse-grained, firm, easy to work, and closely resembles the English Oak.

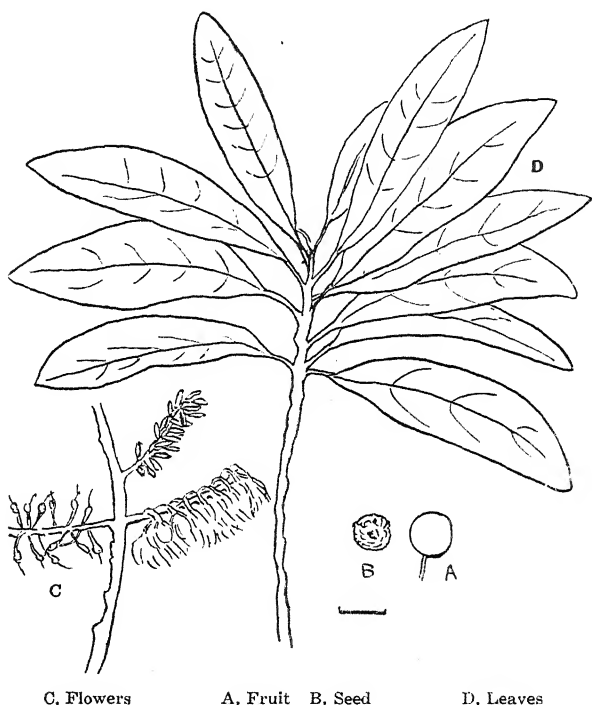
ELAEOCARPUS

(Resemblance of fruit to Olive)

A large tropical Asiatic genus extending to the Pacific Islands, New Caledonia and New Zealand. The ten Australian species are all endemic. They are fair-sized, smooth trees, some reaching as high as 100 feet, growing on the east and north-east coasts, one also in Tasmania, distinguished by the smooth lobeless fruit, which is somewhat fleshy but hard inside. They are decorative in gardens.

Elaeocarpus Bancroftii (after Dr. T. L. Bancroft), is one of the largest trees in Queensland hillside scrubs, where it is fairly common, growing 80 to over 100 feet high. It has various common names such as Nut Wood, Ebony Heart and Johnstone River Almond, and has almond-like, edible seeds which are a favourite food of the aborigines, decorative sparsely-clustered berries an inch in diameter which are intensely blue, fleshy but not succulent. The timber has a dark centre and is hard and durable. Its obovate or lanceolate leaves are 4 to 6 inches long, and narrowed at the base, and the greenish-white flowers in short, dense racemes are large and hairy; the gray bark has a fair percentage of tannic acid, and the light-weight wood is used for furniture, panelling, flooring, rudders and oars.

Elaeocarpus Bauerleni (after the collector, Bauerlen), is a moderate-sized, ornamental but scarce tree which attains to a height of 100 feet occasionally, and grows in New South Wales to the Queensland border, known popularly as Pigeon-Berry Ash or Whitewood. It has alternate, lanceolate leaves with conspicuous veins and toothed margins, 3 to 7 inches long,



C, Flowers

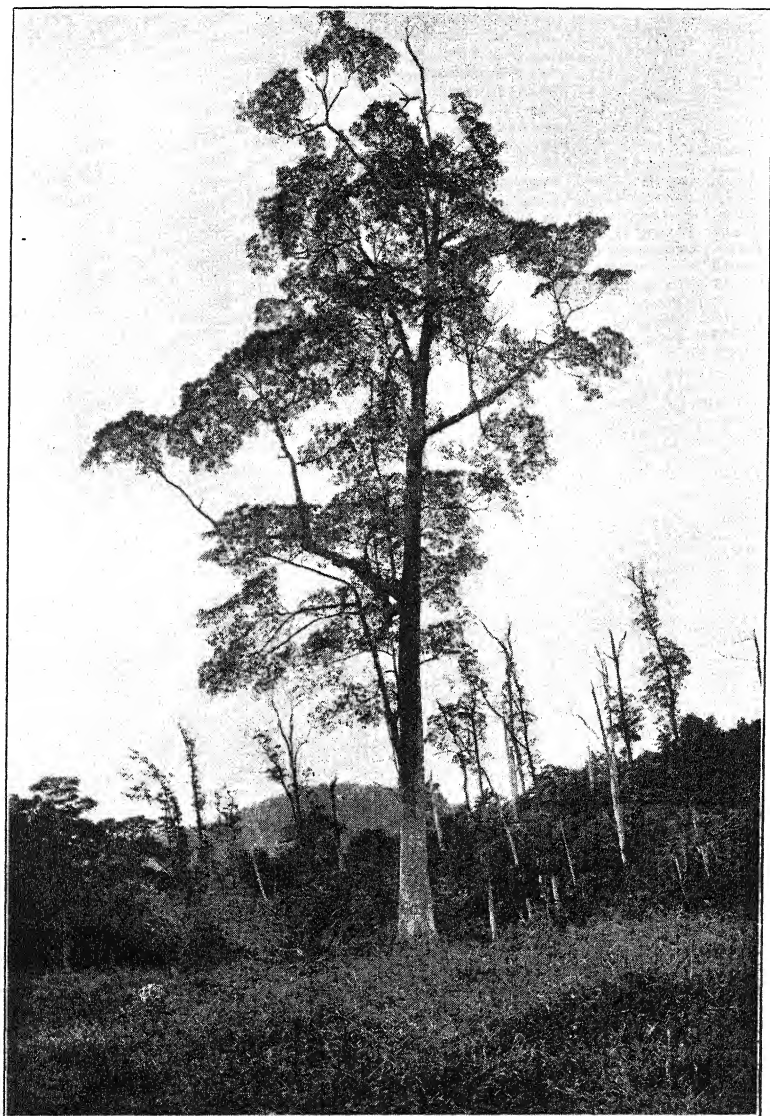
A, Fruit B, Seed

D, Leaves

Elaeocarpus grandis (Bracelet Tree)

white flowers fringed in slender racemes, the fruit an oval berry about $\frac{1}{2}$ inch long. It possesses a timber which is pale-coloured, with a dark heart, close-grained and easy to work.

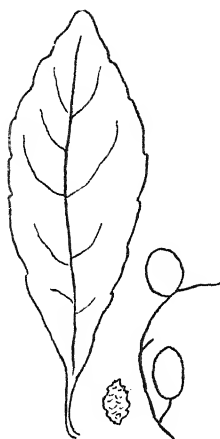
Elaeocarpus grandis (grand): A tree growing on the coasts of Queensland and northern New South Wales. It occasionally exceeds 100 feet high and is known as Blue Fig, Brisbane Quandong, and New South Wales Bracelet Tree (on account of its decorative berries). It has oblong or lanceolate leaves up to 6 inches long and shiny above, large greenish-white flowers in short axillary racemes, and globular bluish berries 1 inch in diameter, and gray bark. It provides a splendid pale-yellow, light-weight timber which has a sheen when planed,



Australian Forestry Journal, photo.

Elaeocarpus Bauerleni (Blue Fig)

and is open-grained, dresses and polishes well; it is used for joinery, cabinet-work and interior fittings.



Elaeocarpus obovatus
(Leaf, seed, and berries)

Elaeocarpus obovatus (obovate leaves): A tree attaining 60 feet in height with oval-elliptical to obovate-oblong leaves 2 to 4 inches long, and white flowers in racemes. The wood is pale-coloured, firm and easy to work. It is known as Pigeon-berry Ash, "Chereen" and "Woolal," and is native to New South Wales, Queensland and Northern Australia.

Elaeocarpus cyaneus (blue), is a small, glabrous tree with leaves 3 to 5 inches long, shallowly serrated and strongly veined, elliptical-oblong in shape, and blue berries. It has been called the Lily-of-the-Valley Tree on account of its small white flowers in sparse clusters. The pale-coloured timber is close-grained, easily worked and used for cabinet-work, indoor joinery, and engraving, resembling somewhat the English Ash.



Elaeocarpus Kirtonii
(Flowers and leaf)

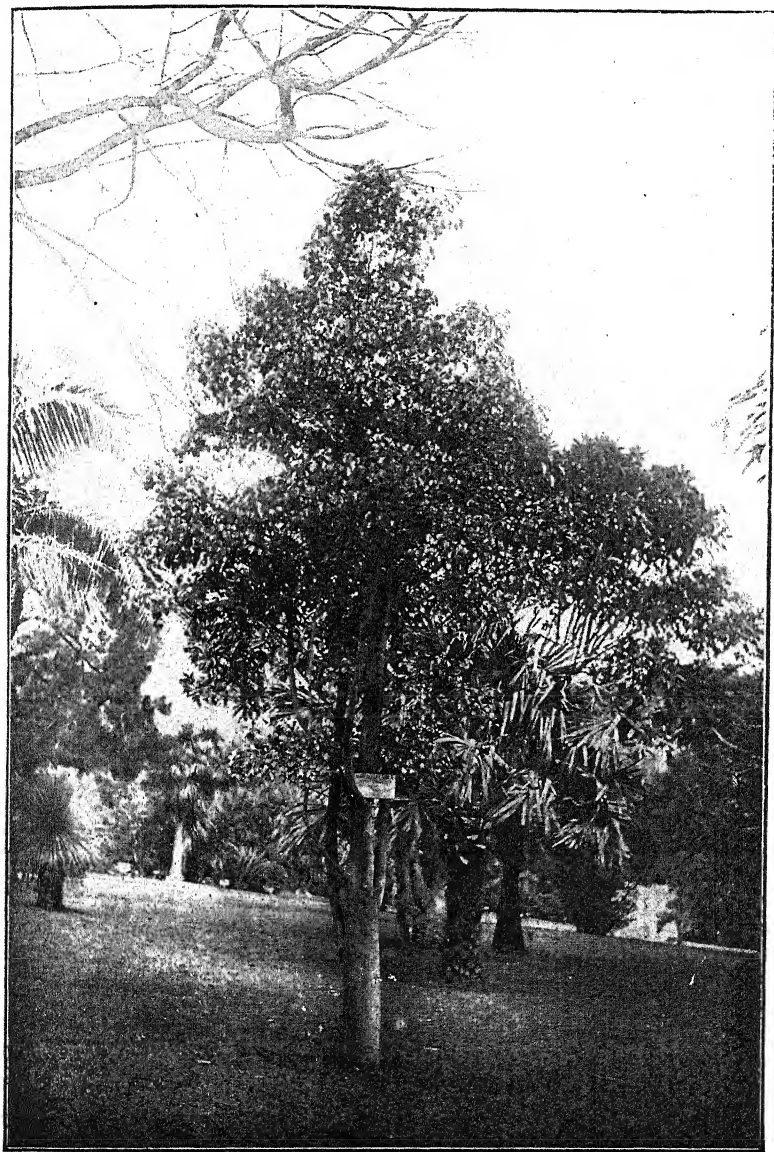
Elaeocarpus holopetalus (entire petals), known as Blue-berry Ash in New South Wales and as Prickly Fig in Victoria (East Gippsland), is usually 50 to 80 feet high but dwarfed when growing at high elevations. The wood is light, white, and close-grained, suitable for turnery.

Elaeocarpus Kirtonii (surname Kirton), known as White Beech, Illawarra Ash, or Mountain Ash, and Native to New South Wales and Queensland, is a tall tree, often over 100 feet high, the leaves oblong, lanceolate, acuminate 4 to 8 inches long, 1 to 2 inches broad, fruit an ovoid drupe, about $\frac{1}{2}$ inch long. The wood is light-brown, fine-grained, suitable for furniture and somewhat resembling English Sycamore.

ELAEODENDRON

(Resemblance of the fruit to the Olive)

The species are numerous in East India and Southern Africa, with a few in tropical America. The four Australian species are endemic.



W. R. Guilfoyle, photo.

Emmenospermum alphitonioides (Bonewood)

Elaeodendron australe (Australian), the Scarlet-fruited Olive Plum or Blue Ash, is a small or middle-sized tree, 20 to 30 feet high and most common on the fringe of the brush-forests near the coasts of New South Wales and Queensland—an ornamental tree, especially in shrub form. The opposite leaves are slightly serrated, 2 to 4 inches long, the flowers small in slender cymes, the bright-red fruit oval and succulent, shiny and about $\frac{1}{2}$ inch long. The timber is close-grained, pinkish, and prettily marked, apt to split in seasoning, but is valuable for staves, oars and shingles.

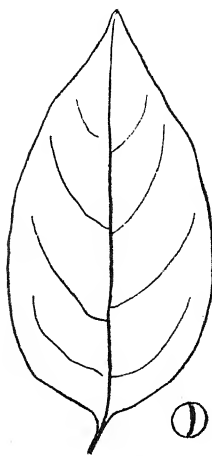
Elaeodendron melanocarpum (black-fruited), is a glabrous tree 40 to 60 feet high, found along the eastern coast of Queensland and North Australia. The wood is of a light colour and has a fine grain.

EMMENOSPERMUM

(Seeds attached to the torus)

A genus of two species endemic to Australia.

Emmenospermum alphitonioides (Alphitonia-like), the Nulla-nullawood, Bonewood, Dogwood, Soapwood, or Yellow Ash of the Coastal districts of New South Wales and Queensland, grows to 170 feet, having ovate-elliptical, opposite, shiny leaves, paler beneath, 2 to 3 inches long, sometimes narrowed at the apex into a blunt point, and separate small flowers on distinct stalks in small dense cymes, the orange-coloured fruit almost cup-shaped, $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter, opening to show the bright-red or purplish shiny seeds. It has slightly wrinkled, gray bark and very hard grayish-yellow timber, which is greasy in nature, straight-grained, 53 lb. weight, and used by the aborigines for their Nulla-nullas or war-clubs. It is placed among the Satinwoods and is durable, and excellent for tool-handles, wheelwright's work and boat-building, also general building purposes; though rather difficult to work, it bends well.



Emmenospermum alphitonioides

Emmenospermum Cunninghamii. (after A. Cunningham), known as Dogwood and native to Queensland, a medium-sized tree with ovate-elliptical, alternate leaves 2 to 3 inches long and somewhat similar to those of *E. alphitonioides*, except that the petioles are longer, the umbel-like cymes not numerous in the terminal corymbose panicle. The fruit is four-celled, and the seeds red and shining.

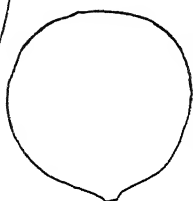
ENDIANDRA

(Fertile anthers)

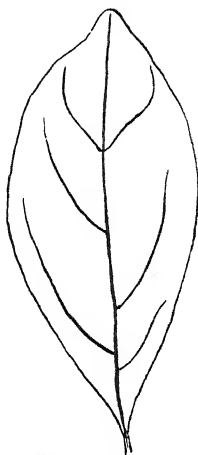
The genus extends over the Indian Archipelago to the eastern provinces of India. The fourteen Australian species are endemic, but not many are important trees except for ornamental purposes.

Endiandra compressa (pressed together), the Queensland Greenheart, also known as Whitebark, attains a height of 100 feet with a 20-in. diameter. The timber is used to a limited extent for cabinet and ornamental purposes.

Endiandra discolor (two coloured), the Domatia Tree, called also Tick Wood, distinctive for its buttressed trunk, grows as high sometimes as 120 feet, but not much valued for its timber. It occurs in the southern coastal scrubs of Queensland, also in the Albany Islands and Cape York.



Endiandra compressa
(Leaf and Fruit)



Endiandra discolor

Endiandra glauca (gray), is a small tree 70 to 80 feet high—a Teak which has a good timber adapted for large work, being hard, close and fine grained, dark-coloured and of a handsome appearance, with a powerful aromatic fragrance when fresh.

Endiandra globosa (globular), the large Apple or Ball Fruit Tree, characterised by its large ball-like fruit up to 2 inches in diameter. A tall straight-stemmed tree possessing a very hard, heavy, close-grained and light-brown timber, difficult to work but fine for heavy constructional work, railway-sleepers, etc. It is used to a limited extent for cabinet and ornamental purposes.

Endiandra pubens (hairy) is a large tree of the Moreton Bay district, Queensland, with a fairly hard, pale-brown timber, firm and tough but not heavy, useful for many purposes.

Endiandra Sankeyana (after J. R. Sankey) is about 70 feet high, growing in the Barron River district, Queensland, and has a good building timber of a greenish colour, close-grained and firm.

Endiandra Sieberi (after F. W. Sieber): A tree 90 feet high called Laurel Corkwood, with trunk often buttressed, the buttresses with edges curving outwards, the pale-brown bark rugged and corky, the thin fleshy fruit blue or purplish and up to 1 inch long. It has a light-brown timber that is soft and easily worked, suitable for cabinet-work and tool handles.

Endiandra virens (leaves green on both sides), the White Apple or Swamp Rosewood, is a small tree up to 20 feet in height, with rather sparse, light-green foliage and a profusion of large yellowish fruits. It is known as the Bat and Ball Tree of New South Wales and Queensland, and is worth cultivation as an ornamental tree. The wood is gray, close-grained, firm, and useful for many purposes.

EREMOPHILA

(Desert loving)

An Australian genus of about 100 species of shrubs or small trees, usually occurring in dry districts.

Eremophila oppositifolia (opposite leaves), known as Twin-leaf Emu-bush, and native to Victoria, New South Wales and South Australia, is a small tree with leaves 1 to 4 inches long, on short petioles, often in opposite pairs, lanceolate to linear with recurved tips, the white axillary flowers solitary on stalks two or three lines long, the fruit a small drupe ovate-oblong with very short hairs. The timber is brown with a paler sapwood, hard, with a close, waxy grain somewhat like that of Satinwood, fairly hard to work but useful for panelling, cabinet-work, veneers and parquet flooring. A cubic foot averages 55 to 60 lb. weight.

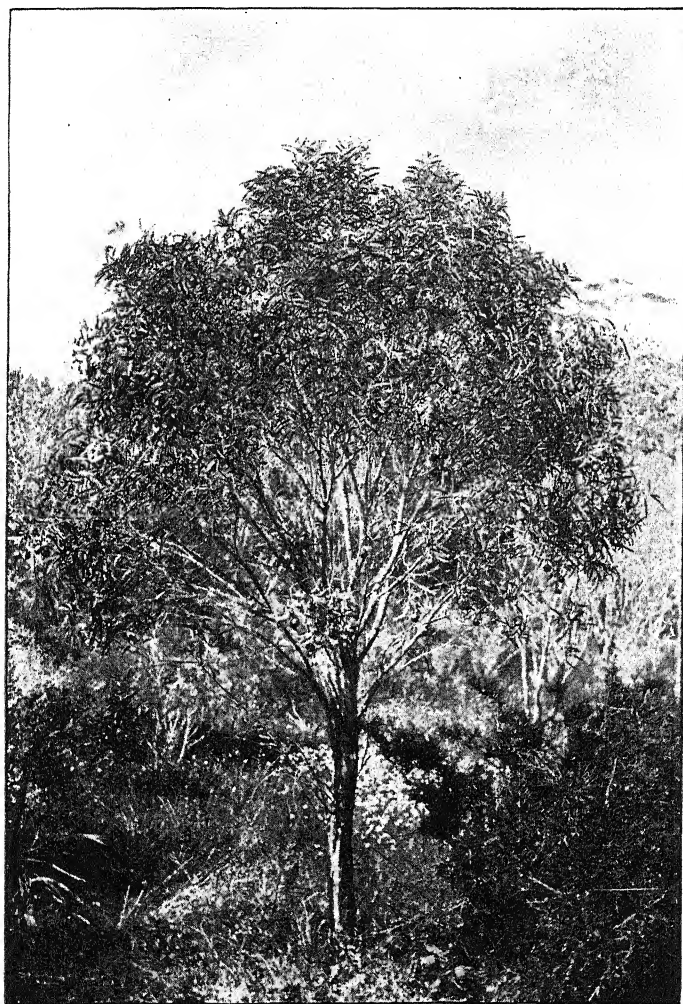
Eremophila Mitchelli (after Sir Thomas Mitchell), known as Sandalwood, Rosewood, Balvory, and native to New South Wales and Queensland, is a small tree 20 to 30 feet high and strongly-scented, with leaves linear-lanceolate, obtuse or with a hooked point, 1 to 2 inches long, the white or purplish flowers solitary in the axils, on pedicels of three to four lines, the fruit ovoid, almost acuminate, with one or two seeds. The wood is hard, brown, beautifully grained, useful for veneers in cabinet-making, and resembles that of Sandal-wood.

ERYTHRINA

(Flowers red)

The genus is widely dispersed over tropical America, Africa and Asia, extending to North America and South Africa. Of the four Australian species one is common in Asia, the others are endemic.

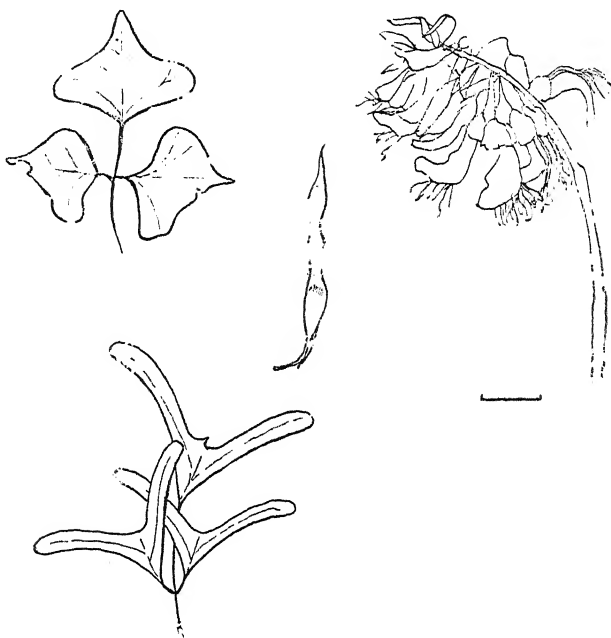
Erythrina vespertilio (bat-winged leaflets), known as Batswing Coral, Coral Tree, Cork Tree and Heilaman Tree, and native to South Australia, Queensland, Northern Australia



Eremophila oppositifolia (Emu Bush)

and Western Australia, reaching 30 to 40 feet in height, with a diameter of 12 to 24 inches, the leaflets broadly cuneate at the base, spreading 3 to 4 inches in breadth, the showy scarlet

pendulous flowers in erect racemes, the elongated pod, torulose, with a few large red seeds. The wood is soft, light and spongy, and is used by the aborigines for making their "heilamans" or shields.



Leaves (two kinds), seed-pod, and flowers of
Erythrina vespertilio (Coral Tree)

ERYTHROXYLON

(Red colour of wood)

A large tropical genus, abundant in South America, less so in Africa and Asia. The two Australian species are endemic.

Erythroxylon australe (Australian): A Queensland tree of 20 to 30 feet with a diameter up to 15 inches, but its habitat is very limited and consequently it is scarce. Its red wood is prettily marked, hard and tough, takes a good polish, and is recommended for cabinet-work. The leaves, which are oblong and 1 inch long, contain coca-tannic acid. Cotton and woollen fabrics have been dyed in tints from yellow to brown with tannin from the bark and leaves of this tree.



W. R. Guilfoyle, photo.

Eupomatia laurina (Copper Laurel)

EUCRYPHIA

(Cup-like calyx)

There are two Australian species, and two others in South America.

Eucryphia Billardieri (after Labillardieri—a French botanist) is a Tasmanian species, growing to 40 or 60 feet, with a moderately hard and strong timber, weighing 40 lb. per cubic foot, free from knots, but very leathery to work, and pale-chocolate in colour—hence its popular names of Leatherwood and Pinkwood; it is suitable for less important cabinet-work and building purposes.

Eucryphia Moorei (after C. Moore), known as Pinkwood, Stinkwood, Acacia Plum, and White Sally, has large white flowers and handsome pinnate, oval foliage, which is firm, flat, entire, glabrous, dark-green above and grayish beneath. It occurs in Victoria and New South Wales to 20 or 30 feet in height, and prefers rich moist soils; it would be worth cultivating in gardens. The bark yields about 20 per cent. of tannic extract, and its wood is moderately hard, beautifully clear, of a warm light-brown colour, and free from knots and easy to work, and dresses well.

EUPOMATIA

(Covered sepals and petals)

The genus of two species is confined to the east of Australia.

*Eupomatia laurina*

Eupomatia laurina (laurel-like): A native of Victoria, New South Wales and Queensland—a small tree with broad-lanceolate to almost ovate leaves and greenish-yellow flowers turning brownish, known as the Glossy Rose Laurel or Copper Laurel, and in Victoria as "Bolwarra," an aboriginal name. It has a small timber that is soft, coarse-grained, and yellowish-brown in colour, which requires very careful seasoning though it dresses well (its weight 47 lb.). It occasionally develops a semi-climbing habit.

EUROSCHINUS

(Southern Schinus)

The genus is limited to a single species endemic to Australia.

Euroschinus falcatus (falcate): A large tree known as Maiden's Blush Wood, also Blush Cudgerie and Ribbonwood, common in the coastal scrubs from the Hastings River, New South Wales, to the Endeavour River, Queensland, and inland to the Bunya Mountains, growing to 150 feet high, with a diameter of about 3 feet, the base of the trunk often flanged in the larger trees, and the bark brown and frequently scaly. The alternate, pinnate leaves consist of four to ten unequal-sided leaflets, the small stalkless flowers in large panicles and the $\frac{1}{4}$ -inch fruit egg-shaped and single-seeded. The timber resembles that of Red Cedar but is difficult to work, being soft, woolly, and perishable, hence its popular name of Ribbonwood. The variety *angustifolius* has narrower leaves coming to a longer point and the flowers are rather larger. Both are ornamental and good shade trees.

EXOCARPUS

(Seed on outside)

An interesting genus of twelve species found in all the States and about six others in New Zealand, Malaysia, India, and elsewhere, the name meaning "seed on the outside" in reference to the curious position of the seed, which is small, hard, brownish-green, and attached to the end of a short, bright-red, fleshy stalk or aril. This red stalk has given rise to the popular name for the genus, Native Cherry. The leaves are scattered and often minute, the flowers extremely small. Some species are shrubs and some are trees 20 to 30 feet high.

Exocarpus cupressiformis (Cypress-like): This species usually a tree of about 30 feet, is the best known of the genus and has the most general distribution, being found commonly but not always on hillsides and rocky ridges in all the States but North Australia. It is only to be found in company with other trees not of the same genus, on the roots of which it often grows as a parasite. It is of graceful habit, like the Cypress, with dense, drooping branches and yellowish-green leaves which are only minute, alternate scales. The fruit-stalks are bright-red, very succulent, longer than broad; the rough dark-brown bark yields a good tannic acid and the timber is handsome, of a reddish-brown colour. Stock will eat the foliage in dry seasons. The aboriginal names for this tree are "Tchimmi-dillen," "Coo-yie" and "Ballot."

Exocarpus sparteus (Broom-like) is a small tree of 15 to 20 feet, called Broom Ballart, and somewhat resembling *E. cupressiformis*, but with more angular branches. It grows in

all the States but Tasmania. The wood is close-grained and handsome, useful for tool-handles, spokes, gun-stocks, cornice-poles, map-rollers and to a limited extent for engraving.

Exocarpus strictus (erect): This tree grows occasionally as high as 20 feet, and is distinguished by the aril being lilac-coloured instead of red, and it is very succulent. The wood has similar uses to the foregoing and also for cabinet purposes.

FICUS

(Fig-tree)

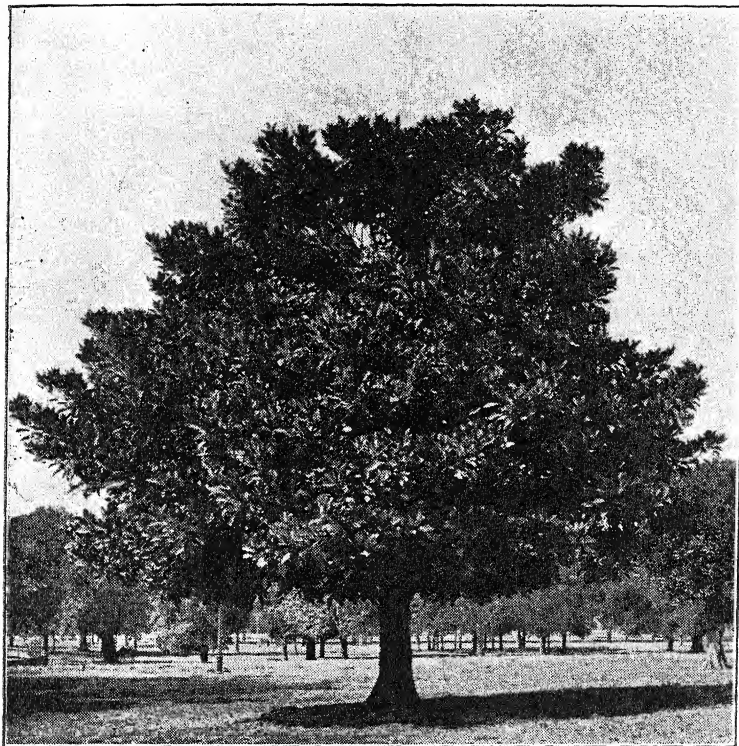
*"Here, in the sultriest season, let us rest:
Fresh is the green beneath those aged trees:
Here air of gentlest wing will fan our breast—
From heaven itself we may inhale the breeze."*

—Byron.

A very large genus, spread over the tropical and sub-tropical regions of the globe, but most abundant in the Archipelago. There are forty species in Australia, particularly abundant and large in size in the coastal forests of Queensland. They are very handsome and fine shade trees and some species have large fig-shaped fruit. There are many interesting features of these trees, one of them being their aerial and buttress roots, and another the fact that some of them have been known to begin life in the fork of the branches or in the moist bark of other trees, usually of a different genus, sending down their aerial roots to the earth, which in time grow upon the roots of the tree that gave them life and kill it, absorbing life from its gradual decay. The actual trunk of the tree in such cases is short, the greater part being made up of the aerial roots which have absorbed the original tree.

Ficus eugenioides (Eugenia-like) is a common tree in tropical and sub-tropical rain-forests, growing as high as 100 feet, its native habitat being New South Wales, Queensland and North Australia. The fruits are $\frac{1}{4}$ to $\frac{3}{4}$ inch in diameter and yellow with a few dark spots. Wood light, soft, and elastic.

Ficus scabra (rough), known as Tongue-leaved, Rough-leaved or Sandpaper Fig Tree, is found from Victoria to Queensland, growing 80 to 100 feet. The leaves are used by the aborigines as a sandpaper for polishing wooden implements, but the wood, like that of all the trees of this genus, is too soft and spongy to be of use for anything but packing-cases, for which it is occasionally but seldom used.



N.S.W. Government Printer, photo.

Ficus macrophylla (Moreton Bay Fig Tree)
(An Immature Tree)

Ficus australis (Australian): A large tree resembling the Banyan of India in habitat and plentiful in some parts of New South Wales, being known as the New South Wales Fig. The timber is soft, brittle and spongy; it may, however, be used for packing-cases.

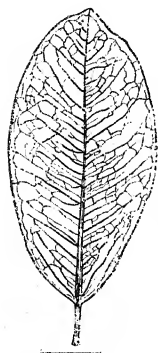
Ficus columnaris (column-like) is known as the Banyan Tree of Lord Howe Island, the Banyan habit being the drooping of its branches to the ground, where they take root and grow up again as trees. (See illustration page 22.)

Ficus Cunninghamii (after A. Cunningham): A robust tree that produces great quantities of small figs, of which the birds are very fond; it is popularly known as White Fig and is plentiful in the coastal scrubs of eastern Australia from as

far south as the Macleay River, New South Wales, to northern Queensland. It is semi-deciduous, with its leaves on fairly long stalks and a small, whitish fruit dotted with red, and grows to over 100 feet high with a diameter of over 6 feet but without the buttress roots common to the genus. Its wood is of a light colour, soft and porous, but not durable.

Ficus glomerata (clustered): A large tree known as Leichhardt's Clustered Fig. Its leaves (or rather the small galls upon them), also the fruit, sap, and astringent bark have been found to possess medicinal properties, though these have not been commercialised. The leaves have been used as fodder for cattle and the red ripe fruit hangs in clusters along the trunk and on some of the highest branches. The wood is used for well frames.

Ficus macrophylla (large-leaved), the Moreton Bay Fig, is by far the most generally known of the Fig trees of northern New South Wales and Queensland, and cultivated considerably in the other States as an ornamental tree in parks and gardens and sometimes (unsuitably) as a street tree, on account of its handsome appearance with widespreading and always richly-leaved branches. The tree grows in any kind of soil, 50 to 80 feet high with a diameter of 3 to 6 feet and even more. The leaves are oval, 4 to 6 inches long by about 3 inches broad, fairly thick and fleshy, shiny, dark-green on the upper side and brownish-yellow underneath, and may with the fruits be eaten by stock. The bark is smooth and dark-gray in colour. The tree has little or no utility, though its soft wood, of a pale-brown colour, has a beautiful wavy figure, but it is very difficult to season. The strong and durable fibres of its roots are used by the aborigines for fishing-nets.

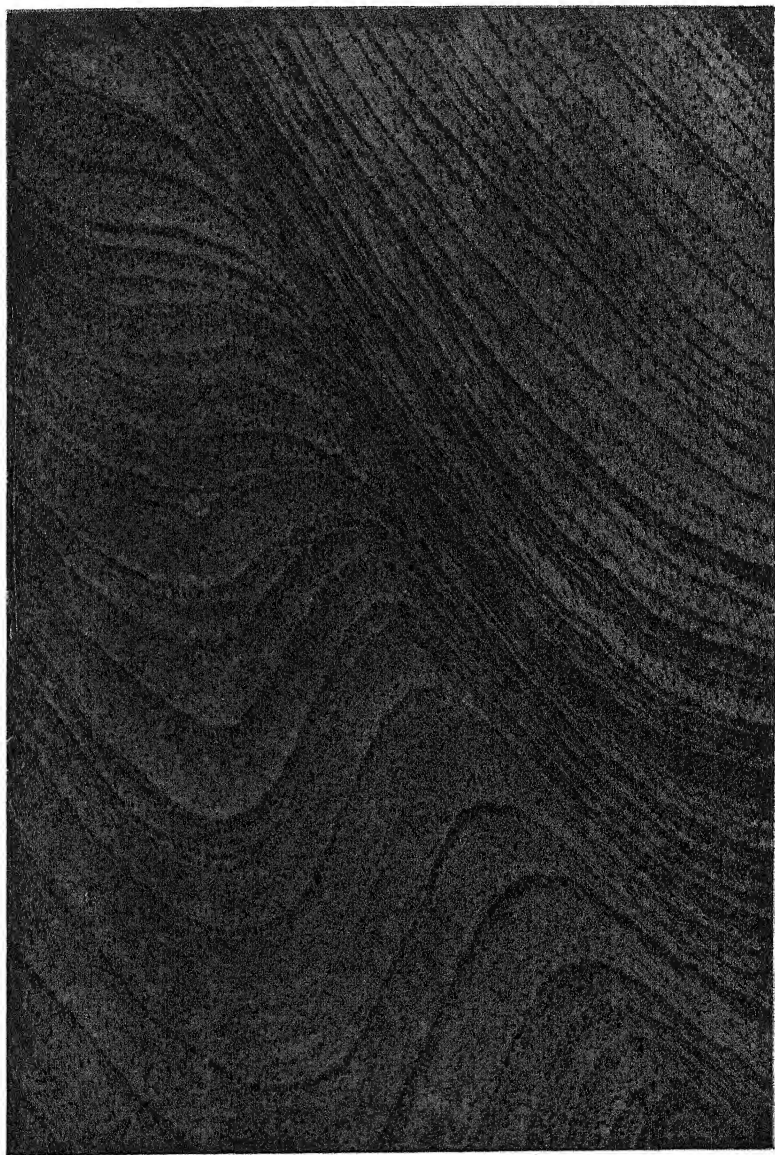


Ficus rubiginosa

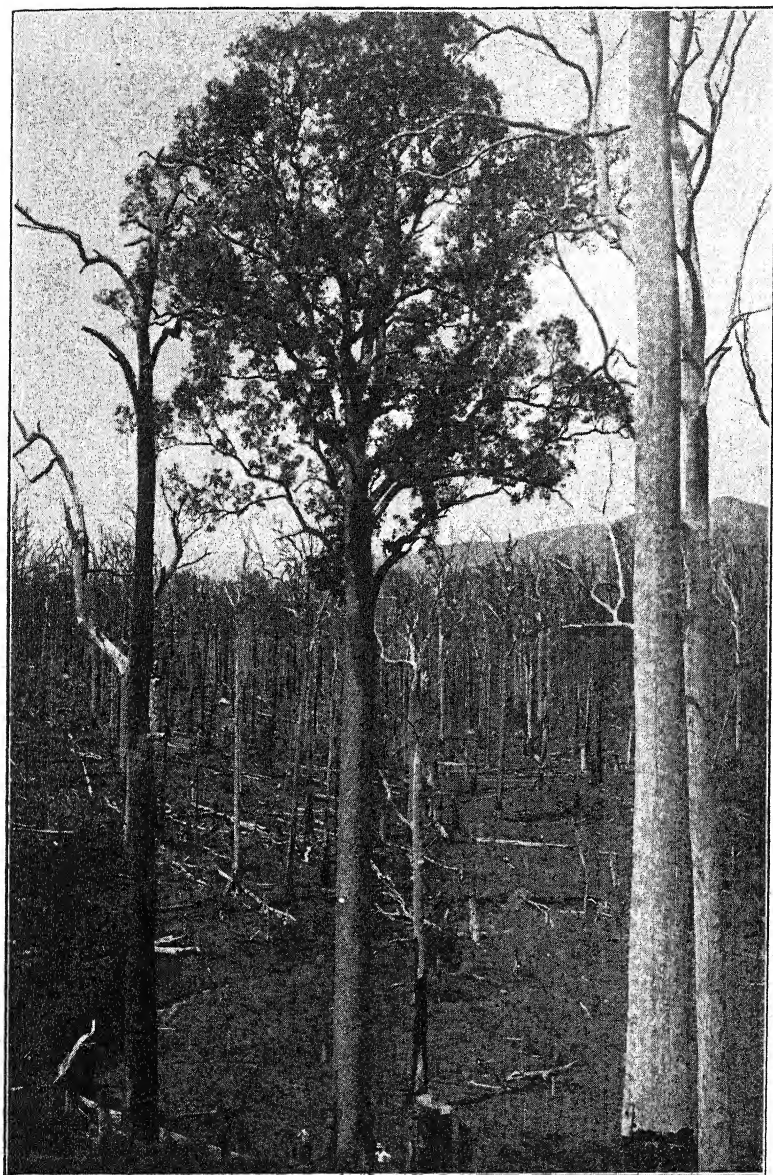
Ficus rubiginosa (rusty), the Rusty Fig or Port Jackson Fig, is a tree of small size and easily recognised by the usually rusty-hairy underside of the oval fleshy leaves, which may be eaten by cattle. The timber is soft, brittle and spongy, but is used sometimes for packing-cases.

Ficus stenocarpa (slender-fruited) is a tree of about 40 feet of New South Wales and Queensland, known as Sandpaper Fig because the leaves are harsh and rough. It is distinguished by its smooth, hairless fruit. The wood is light, and elastic.

Ficus Watkinsiana (after Geo. Watkins): A very large glabrous tree with lofty trunk and smooth light-coloured bark—the base of the stem flanging out, but not so prominently as in *Ficus macrophylla*;



Cedrela australis
(Red Cedar)



N.S.W. Government Printer, photo.

Flindersia australis (Crow's Ash)

the leaves are lanceolate, about 6 inches long and $2\frac{1}{2}$ inches wide in the centre, green on both sides and leathery. It is found on the Bellinger River, New South Wales. The wood is of light colour, fairly close-grained, easily worked, and may be useful for packing-cases.

Ficus Henneana (Surname Henne) is a glabrous tree of Queensland and North Australia, semi-deciduous and only dropping its leaves for a short period. It has purple or reddish fruit dotted with white, and is closely allied to *Ficus Muelleri* of New South Wales. Its wood is straw-coloured, light, soft and porous, and is used for packing-cases.

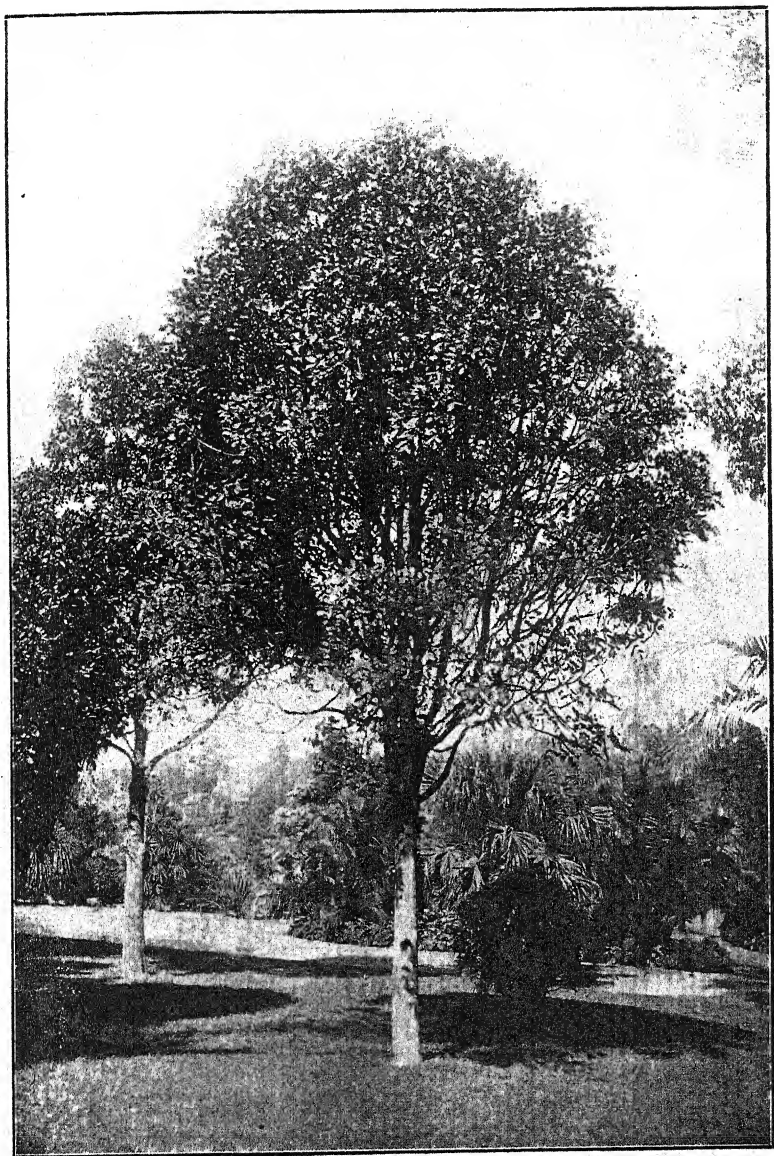
FLINDERSIA

(after Flinders)

This genus, found in New Guinea and New Caledonia, also in Australia, and called after the famous navigator, is commonly known as Pod Trees on account of their broad and thick seed-pods, of which genus there are sixteen species in Australia.

Flindersia australis (*Australian*): A very decorative tree which might be grown to advantage in the streets and for avenues; its height is 80 to 130 feet and diameter 3 to 4 feet. One of its popular names is Rasp-pod Tree, referring to the rough, tuberculated fruits common to this genus which the natives use for rasps in preparing roots, etc. The leaves are alternate or opposite with prominent midrib and nerves, the flowers white with a brown centre and in dense, much-branched panicles, and the rough or scaly bark occasionally yellowish but usually brown. It is native to northern New South Wales and Queensland and plentiful; the natives of the Richmond and Clarence Rivers gave it the name of "Cudgerie." It is called Crow's Ash by foresters and Teak by timber-getters, its yellowish-brown timber being one of the best hardwoods of the brush-forests for carriage work and railway purposes, flooring, etc. It is hard, close, very strong, and durable in the ground and used for fencing, not discoloured by iron, shrinks but little in drying, and weighs 50 to 60 lb. per cubic foot. It has a neat oak-like grain and takes a good polish but is of a greasy nature and difficult to dress and slightly liable to split, but especially useful for dancing-room floors.

Flindersia Bennettiana (after Dr. George Bennett): An ornamental tree 90 to 130 feet high, native to New South Wales and Queensland, known as Bennett's Ash and distinguished by the large, thick, glossy leaflets, and rather smooth

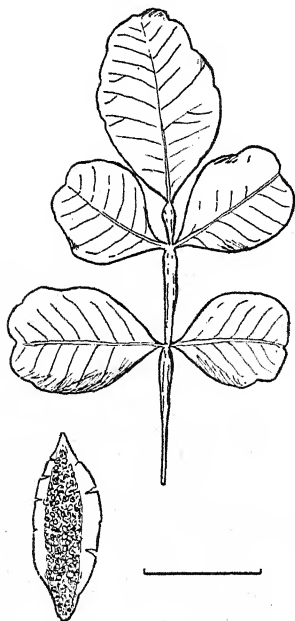


W. R. Guilfoyle, photo.

Flindersia Oxleyana (Australian Yellow Wood)

bark. It is called Teak but has not come into much use though it splits freely, is moderately light, close-grained, and dresses well, its weight about 48 lb.

Flindersia Chatawaiana (after J. V. Chataway), the Red Beech or Maple of Queensland. A large tree with a dense and fairly compact crown and a clear uniform trunk of 4 to 8 feet diameter, generally sound. It has opposite leaves with usually seven oblong, falcate, obtuse leaflets 3 to 4 inches long by 1 to 2 inches broad, with rather pale undersides, the fruit 3 inches or more long, tapering at each end. It is found only in the tropical areas of North Queensland, from Cardwell to Herberton, generally in volcanic soil, and the timber is fairly hard and light-brown in colour, with a nice figure, takes a very good polish, and is much used for furniture and also inside decoration.



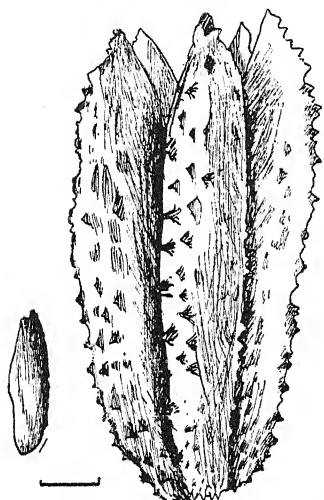
Leaves and seed-vessel of
Flindersia collina

Flindersia collina (found on hills) is the Broad-leaved Leopard Tree, so called because the greenish-gray bark is shed in roundish pieces which leave patches on the surface of the trunk, and also known as Leatherwood. It is a large tree growing plentifully in the drier scrubs of southern Queensland and especially in the Tooloom Ranges in the extreme north of New South Wales, and has a pale-yellow hard timber resembling but slightly inferior to Teak.

Flindersia Ifflaiana (after Dr. S. Iffla): A tall evergreen tree similar in character to *Flindersia australis* and growing from 30 to 50 feet high on the north coast of Queensland, known as Hickory Ash and Cairns Hickory, its timber yellowish, strong and durable, when used for inside work.

Flindersia maculosa (stem spotted): A small tree growing to 40 feet, found in brigalow scrubs, called Leopard Tree or Prickly Pod, and native to New South Wales and Queensland. It is a handsome and remarkable tree with rather pendulous branches. A curious feature of the manner of its growth is the fact that it first grows in a tangled mass of long thin branches and later a leading shoot appears which, for a time, the growing stem carries with it and is protected by the tangled branches, which gradually atrophy, leaving a clean stem growing straight. The foliage and twigs are

eagerly eaten by sheep in drouhty seasons, and it has a very pleasant-tasting gum of a clear amber colour which exudes in large masses from the stem and branches in the summer and makes a good adhesive mucilage. It has one of the closest-grained of Australian timbers, very similar to English Box, bright-yellow in colour. very hard, tough and difficult to work.



Fruit and seed of
Flindersia Oxleyana

Flindersia Oxleyana (after J. Oxley) is popularly known as "Long Jack" because it has a long, clean, smooth-barked stem, and also called Light-Yellow Wood, growing up to 140 feet with a 3 or 4 feet diameter, in the scrubs of the north coast of New South Wales and the south coast of Queensland. Its pale-yellow-wood is not readily attacked by white ants and is suitable for coachbuilding, railway - carriage frames, boat-building, tool-handles, barrels, joinery and cabinet-work, also carving, and its sap gives a yellow dye.

Flindersia Schottiana (after H. Schott), known as Bumpy Ash on account of the protuberances on the stem where branches have fallen off, and Queensland White or Silver Ash, also Schott's Rasp-Pod Tree; it is confined to the area from the Hastings River, New South Wales, to the Herberton district, Central Queensland, its height 60 to 150 feet, and its diameter 18 to 36 inches. It grows well further south when planted. The leaves resemble those of the Silky Oak (*Grevillea robusta*), the flowers are very fragrant, the fruit about 4 inches long, and the timber a pale-yellow colour, hard, durable, close-grained, and prettily marked, useful for shingles and cabinet-work, though it sometimes shrinks irregularly.

FUSANUS

(Spindle tree)

The genus is almost limited to Australia, and has five species—all Australian but one which occurs in New Zealand; they are interesting in many ways and grow in all the States but Tasmania. It was the Fusanus wood that was specially favoured by the Australian aborigines for making fire by rubbing with wedges, and they also used the leaves as poultices, the fruit and seeds for food and the seeds also for ornaments, such as necklets. An oil similar to that of Sandalwood is also obtained from it.

Fusanus acuminatus (pointed leaves), known as the Australian Peach or Quandong, has thick and leathery pale leaves, usually opposite, 2 or 3 inches long, which when young occasionally have a short hooked point, and the small globular bright-red fruit about $\frac{3}{4}$ inch in diameter, with a fleshy outer layer, is edible and makes a good jam or jelly. The small round kernel is also edible, full of oil, wholesome and of a pleasant taste; the seeds may be burned like the Candle-nut (*Aleurites*), and the bark yields about 19 per cent. of tannic acid and 40 per cent. of extract. This tree is usually 20 to 30 feet high, but sometimes no more than a shrub, and the sapwood is almost white, the heartwood flesh-colour, with a pleasant fragrance when freshly cut or re-worked, rather difficult to work but takes a fine polish, and useful in joinery and cabinet-work but usually too small. It is a rapid grower and might be generally cultivated as an ornamental shrub.

Fusanus persicarius (from name of fruit, viz., Native Peach): The Native Peach, sometimes called Australian Sandalwood, its height usually that of a shrub but sometimes reaching 20 to 30 feet; its fruit is globular and fleshy, the inside minutely pitted, the wood rather like Sandalwood.

Fusanus spicatus (pointed) is a small tree up to 30 feet high, growing on the coasts of South and Western Australia, with spreading but not pendulous branches. It furnishes scented Sandalwood and the wood on distillation yields 2 per cent. of oil. The timber is useful for select cabinet-work and is also exported.

GEIJERA

(After J. D. Geijer)

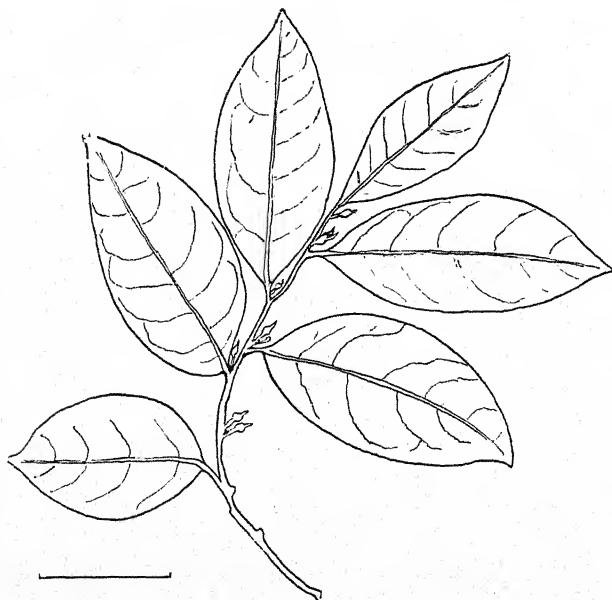
The genus is limited to Australia. Geijera trees are known chiefly for their very hard wood, which has earned them the names of Ironwood and Axe-breaker.

Geijera Muelleri (after Baron von Mueller) is found in New South Wales and Queensland, 40 to 60 feet high, a glabrous tree with scattered, broad, ovate or oblong simple leaves 2 to 3 inches long, and yellowish-white flowers in compact racemes, the wood nicely marked and pleasantly scented when green, the heartwood dark and beautiful, the rest light-coloured, all hard and close-grained, excellent for veneers, its weight 78 lb. It is called the Balsam of Copaila Tree on account of the bark containing a strong bitter with the odour of balsam, and probably because of this odour ants will not infest this tree.

Geijera parviflora (small flowers), called "Wilga" by the aborigines and still generally known by that name in New

South Wales and Victoria, is a shapely, handsome, shady tree, 20 to 30 feet high, sometimes called Australian Willow on account of its drooping habit, growing on the north coast of New South Wales and the south coast of Queensland, also in north-west Victoria, and less plentifully in South and Western Australia. The narrow ovate-lanceolate, entire leaves are equally green on both sides, obtuse or pointed and mostly 3 to 4 inches long with a relatively short stalk, numerous small yellowish-white flowers grouped in rather loose, broadly pyramidal panicles and the seeds are hard and shiny black. Its leaves, which are narrower than the other species, are a favourite food for sheep and it is known as Sheep Bush in the interior of Australia. It is very hardy and drought-proof. The timber has a pleasant scent when freshly cut but is usually too small to be of much use, being of a greasy nature, likely to have gum-veins, difficult to dress, and is also liable to split in seasoning.

Geijera salicifolia (Willow-leaved): Fairly common in the brush-forests from the Illawarra district, New South Wales, northward into Queensland, known as Scrub or Brush Wilga, Balsam Tree, Greenheart and Green Satinheart; a small to medium-sized tree with rather scaly, brown or dark-gray bark. The wood is hard, close-grained, of a somewhat greasy nature; suitable for engraving, skate-rollers and hand-screws.



(Glochidion Ferdinandi)

(See next page)

GLOCHIDION

(Flowers on edges of leaves)

A genus of two species in Australia, but numerous in tropical Asia and Africa.

Glochidion Ferdinandi (after Baron von Mueller), growing to 70 feet, is found from the Illawarra district of New South Wales to Cairns, Queensland, also in the north-west. The leaves are simple but often pinnate, alternate, lanceolate or ovate, 2 to 4 inches long; the small flowers and fruit spring from or above the fork of the leaves and the bark is gray and finely fissured. It is known as Cheese Tree or Pencil Cedar on account of the quality of its wood, but more popularly as Water Gum, Rivulet Tree, Rain or Weeping Tree, the last because of the curious effect of insect associations; a species of "Frog-hopper" live on the sap of the softer parts of the tree and are attacked by ants in search of moisture, causing a dropping of fluid from the tree. It has a moderately hard, fairly close-grained, interlocked, tough timber, 50 lb. weight, brown with a small silver grain, and suitable for coach-building, table-legs, etc. Synonym: *Phyllanthus Ferdinandi*.

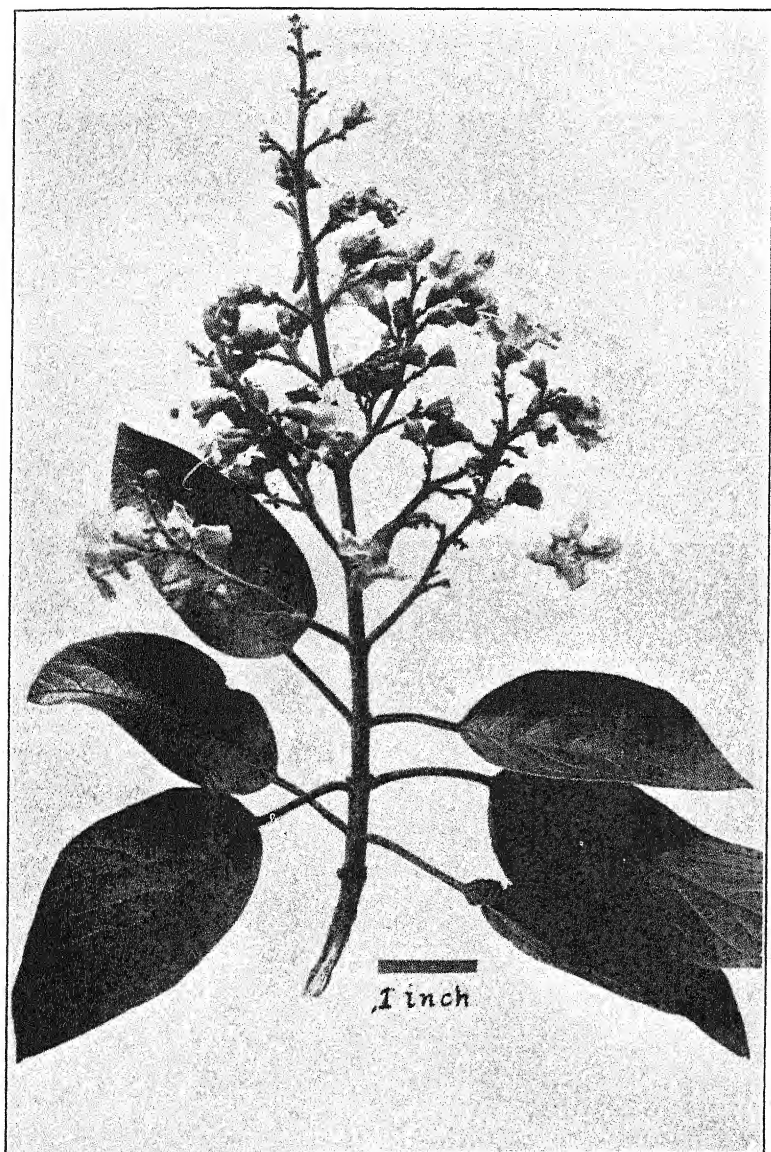
GMELINA

(After S. Gmelin)

The genus extends over tropical Asia and the Indian Archipelago. The three Australian species are endemic, and native to New South Wales and Queensland, being small trees with purplish flowers in cymes, ovate and rather long leaves, the fruit a succulent berry, and their timbers are of value for flooring of houses and decks of ships and similar purposes.

Gmelina fasciculiflora (clustered flowers), known as White Beech or White Mahogany, is a Queensland tree about 60 feet high that can be used most satisfactorily for wood-carving as it does not expand or contract if moderately seasoned, very close-grained, pale-coloured, and not attacked by borer insects. The flowers are of a pale purple colour.

Gmelina Leichhardtii (after L. Leichhardt), known as Queensland Jungle Beech or White Beech and Gray Teak, growing often to a considerable height in New South Wales and Queensland, is partly deciduous, with scaly gray bark, but not very plentiful in accessible areas—one of the most useful of Australian timbers and used for furniture, outdoor flooring, general fittings, and wood-carving. The flowers are white with purple markings.



Dept. Agric. and Stock, Brisbane, photo.

Gmelina Leichhardtii (White Beech)

Gmelina macrophylla (large-leaved): A tall tree of Queensland and North Australia, with close-grained wood, the sapwood of a pretty purple colour and prominently marked, the heartwood gray, and useful for flooring boards and planking—the timber closely resembles that of *Gmelina Leichhardtii*.

GREVILLEA

(After C. F. Greville)

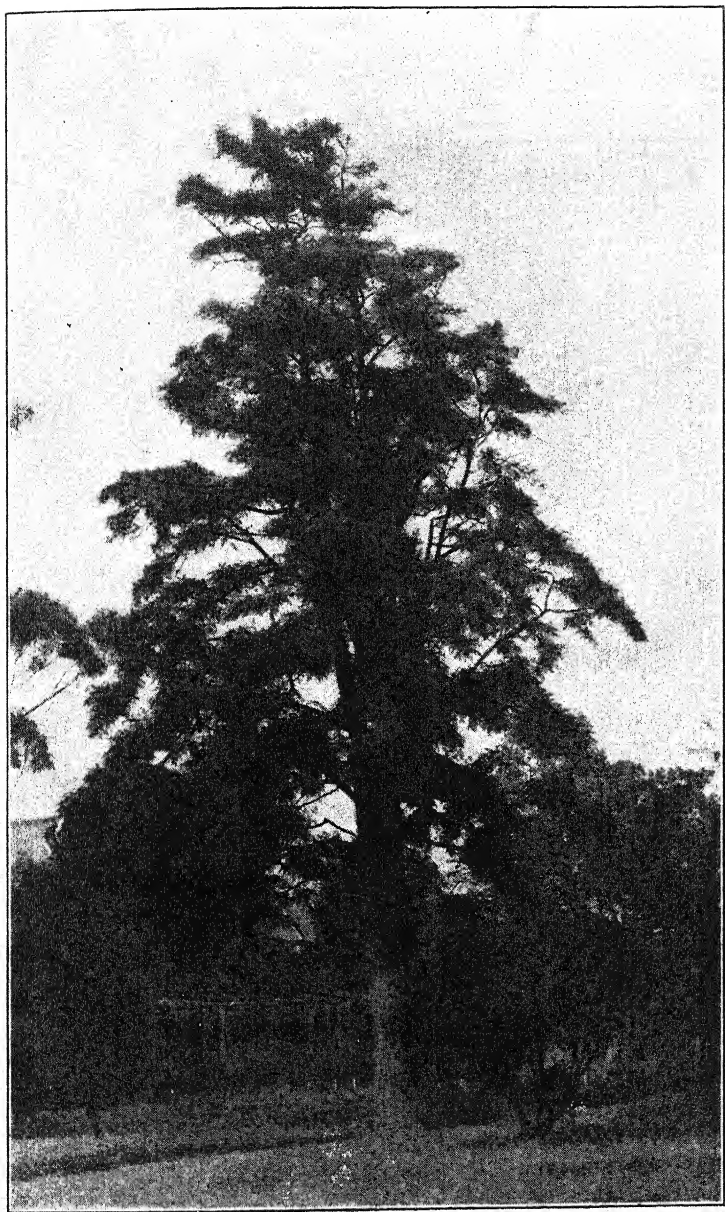
With the exception of a few species the genus is limited to Australia. It is an important and interesting as well as a large genus of shrubs and a few trees. The shrubs are sometimes small though widespreading and are all decorative and becoming popular for private gardens, having quaintly-shaped flowers of various bright colours, white, yellow, orange, rose, red and crimson, generally of two colours together.

Grevillea robusta (robust), popularly known as Silky Oak and native to Queensland and New South Wales, is much favoured in other States for street planting, parks, and large gardens. It is a quick grower and hardy, very ornamental, especially in the flowering season, and grows at its best to 80 or 120 feet with a diameter of 24 to 36 inches, but is usually 30 to 50 feet high in cultivation. The flowers are in long brush-like racemes of a deep orange (cadmium) colour, the fruit a boat-shaped follicle, about $\frac{3}{4}$ inch long, with winged seeds. The bark is dark-gray or nearly black, furrowed, and the timber strong, elastic, durable, moderately hard and easy-working, the knotty wood very pretty in marking, light-coloured, silky in texture, oak-like, and good for cabinet-work. The tree is easily propagated from seed and has been introduced into other countries.

Grevillea gibbosa (swollen): A tree of variable size but not tall, native to Queensland and North Australia, with dark-brown wood, hard and close-grained, prettily marked, but of too greasy a nature to polish well.

Grevillea polystachya (many spiked panicles) is found in Queensland and North Australia, growing to 30 feet high, with linear leaves 6 to 10 inches long and prominently midribbed and veined; flowers in rather dense racemes 3 to 4 inches long. It has red wood which is hard, close-grained, durable, prettily marked, and suitable for cabinet-work, veneers, etc.

Grevillea striata (channelled), known as Silvery Honeysuckle and by its aboriginal name of "Turraie," is a Beefwood with a wide range in all States but Victoria and Tasmania, usually a tree of 30 to 40 feet, attaining to about 80 feet in Central Australia, with a diameter of 18 to 20 inches, and

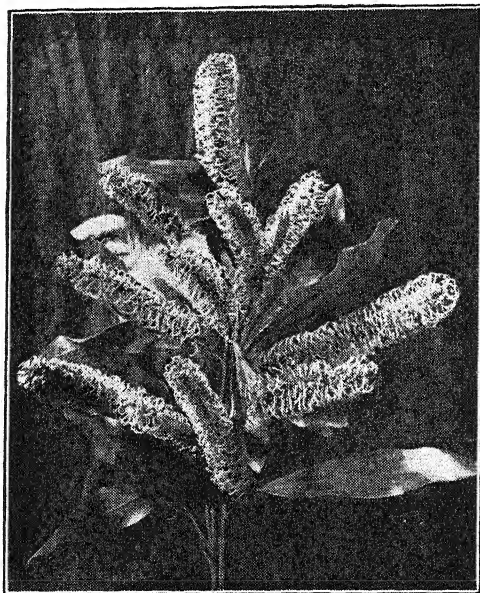


N.S.W. Government Printer, photo.

Grevillea robusta (Red Silky Oak)

having a rough and thick, furrowed bark, narrow linear often-curved leaves 6 to 18 inches long, and handsome but small spike-like flowers in slender racemes, 2 to 3 inches long, the fruit a follicle about $\frac{3}{4}$ inch long, open at the side. It is scarce, but its timber is excellent for heavy cabinet-work, being of a beefy colour and appearance, prettily marked with a simple mottled figure, polishes well, very like that of *Grevillea Hilliana*, durable, and used for furniture, cabinet and fancy work, fencing, etc.

Grevillea Hilliana (after Walter Hill), known as the White Silky Oak and so called on account of its long white cylindrical flowers. The leaves are long, ovate-oblong, very



E. E. Pescott, photo.

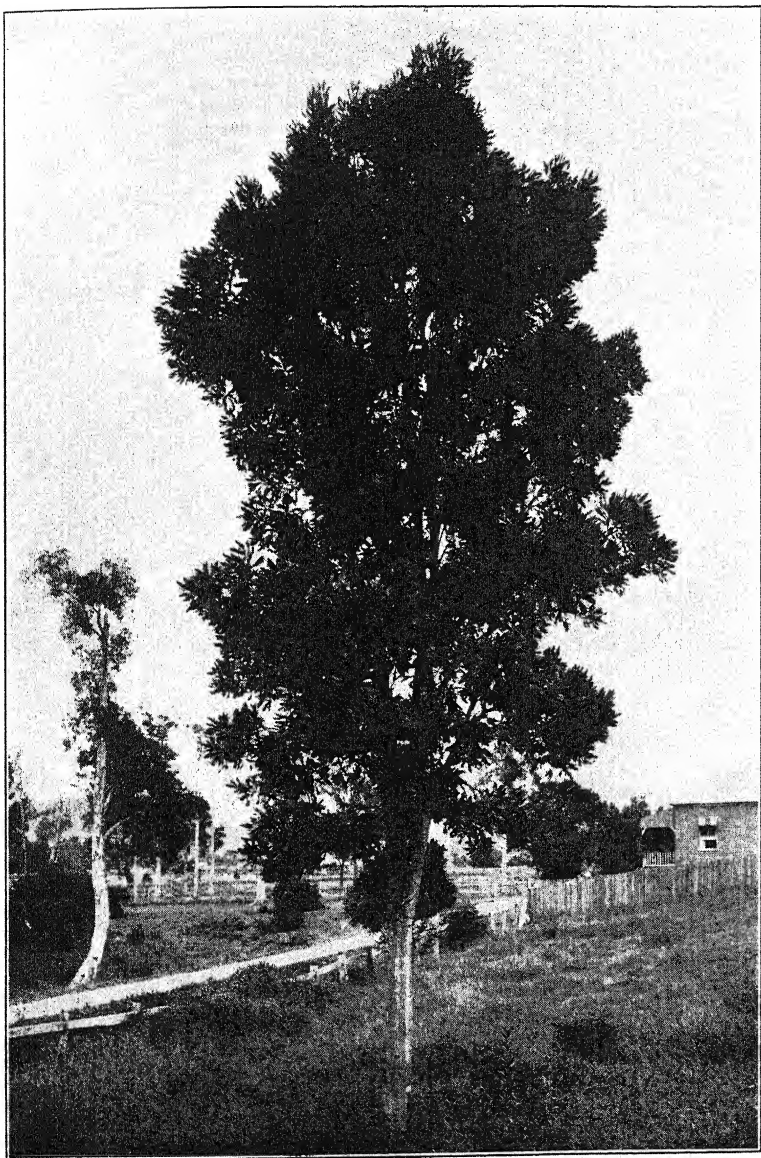
Flowers and Leaves of
Grevillea Hilliana (White Silky Oak)

obtuse but tapering at the base, and 6 to 8 inches long. The usual height of this tree is 50 to 60 feet but sometimes it attains 90 feet, and grows naturally from the Clarence River, New South Wales, to Cairns, Queensland, but is cultivated to some extent in other States. The wood, which much resembles that of *Stenocarpus salignus*, is deep-red in colour, beautifully grained and very handsome when polished, 62 lb. in weight, naturally greasy, and suitable for heavy cabinet-work and often used for veneers.

HAKEA

(After Baron Hake)

The genus is limited to Australia, with over a hundred species of shrubs and small trees, some of which are well known and popular for gardens. Most of the shrubs are natives of Western Australia but many are cultivated in other States, and the trees grow in the more temperate States of New South



N.S.W. Government Printer, photo.

Grevillea striata (Beefwood)

Wales, Victoria, South Australia and Tasmania; only a few are found in Queensland. Some are called Needle Bush on account of the leaves, which are about 2 inches long and as sharp as, but much thicker than, needles; others are willow-leaved, some have flat, long and narrow leaves; some have flowers so shaped as to give the trees the name of Pincushion, but all have the same or similar hard fruit with winged seeds.

Hakea laurina (Laurel-like), the Pincushion Tree: This species is perhaps the best known and most popular of the genus, being largely cultivated in gardens as a tall shrub. It has flat, longish, veined bronze-green leaves, rather like those of some Eucalypts, but with red edge. The flowers are remarkable, being round balls about the size of a golf-ball, of bright crimson covered with thin creamy-coloured stamens like short pins, the flowers growing on the numerous branchlets; the seed-vessels are extremely hard and woody, grayish-black, usually about 1 inch long and $\frac{3}{4}$ inch in diameter, which open in two solid parts, revealing two flat, winged, black seeds.

Hakea dactyloides (leaves resembling fingers): A small tree of 30 to 40 feet high with a 9-inch diameter, native to New South Wales, Victoria and Queensland. The wood is hard, close-grained and suitable for turnery and cabinet-work.

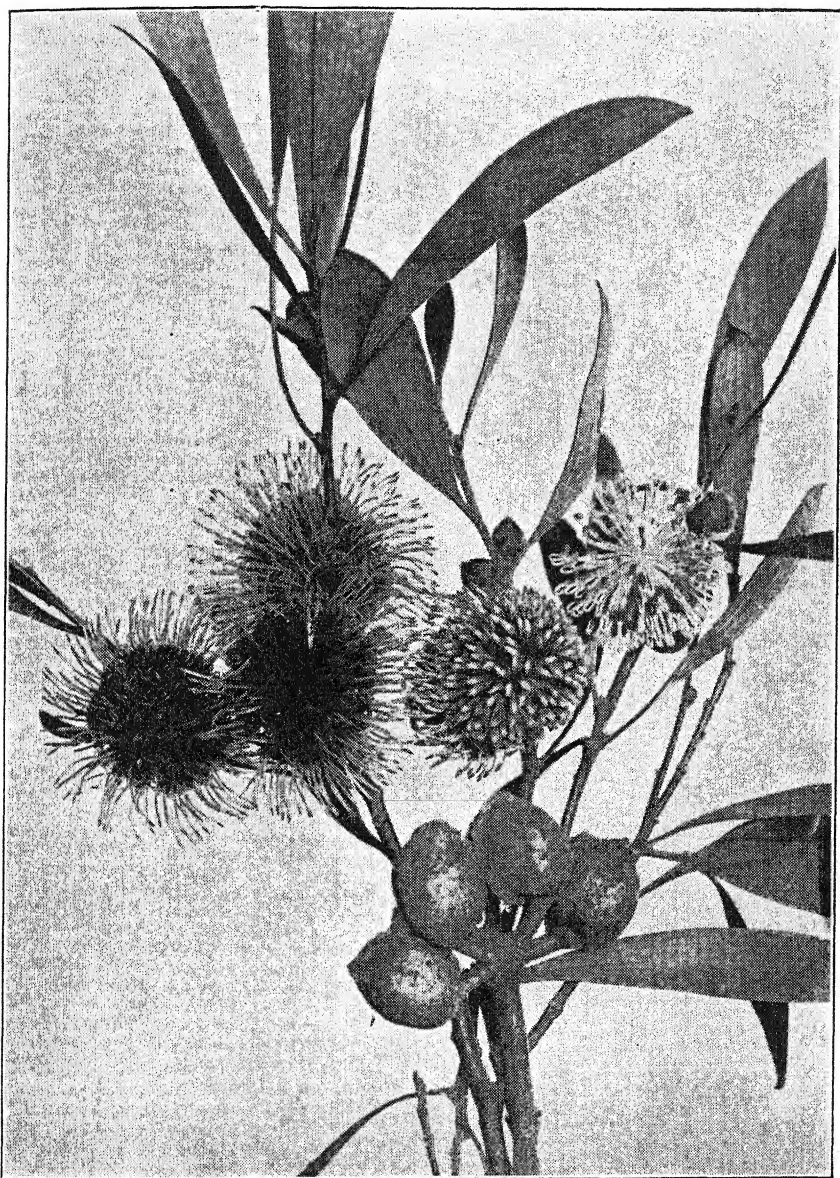
Hakea eriantha (flower woolly): A small tree with long grayish-green lanceolate leaves and small hairy white flowers growing on the branchlets without stalks, and rather large and nearly blunt fruit. The wood is used for tobacco pipes, veneers, etc.

Hakea leucoptera (light-coloured seed wing): A Needle-Bush, which may occasionally grow up to 25 feet, found in all the States but Tasmania and Western Australia. It has a wood that is coarse-grained, soft, polishes well in spite of its resin, and is used in the West for making tobacco-pipes and cigarette-holders, paper-knives, rules, tool-handles, and such-like articles, as the radiating lines and reddish colour make it effective.

Hakea lorea (thong-like) is rather rare, growing in the interior of all the States to about 20 feet high, called Cork Tree from its rugged bark, and having a small timber, hard, heavy (71 lb.), and much prized for bullock-yokes.

Hakea pedunculata (pedunculate): This species grows in the Endeavour River district, North Queensland, and provides a dark-brown timber which is nicely marked and suitable for the same purposes as that of *Hakea leucoptera*.

Hakea sericea (silky), known as Silky Hakea, and native to Victoria, New South Wales and Tasmania, is a tall shrub or small tree with stiff terete, pungent leaves 1 to 3 inches long. the flowers in almost sessile clusters with hairy pedicels, the



Buds, Flowers, Fruit and Leaves of *Hakea laurina*
(Pincushion Tree)

fruit about 1 inch long, thick and rugose, with a short, straight beak. The wood is tough and useful for tool handles, but is too small to yield timber.

Hakea saligna (willow-like), known as Foley Wood, is a small bushy tree of 15 to 20 feet which rarely reaches up to 30 feet, growing in the coastal districts of Queensland and the

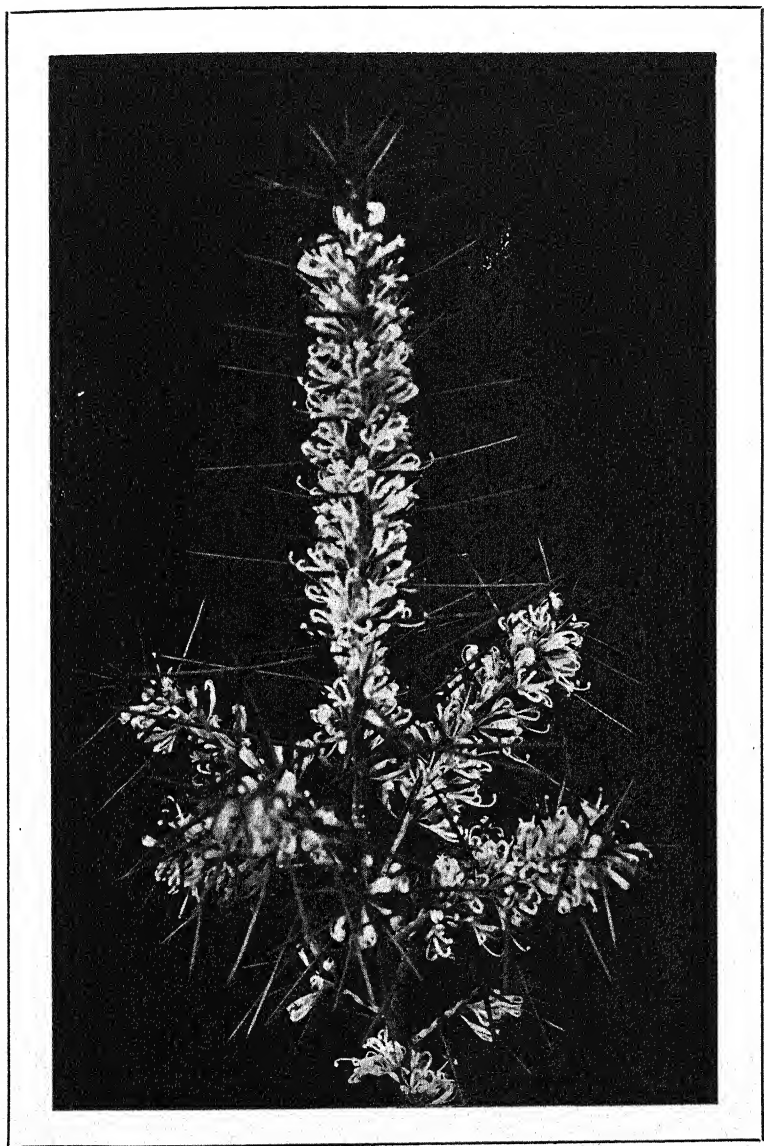


F. Chapman, photo.

Leaves, Flower and Fruit of
Hakea suaveolens (Sweet Hakea)

adjoining ranges, also in Victoria and New South Wales. It has small flowers in dense clusters and fruit about 1 inch long, with an incurved beak; the wood is like that of *Telopea oreades* and suitable for small turnery and other work, its weight 44 lb.

Hakea suaveolens (sweet-smelling): A Needle Bush endemic to Western Australia and known as Sweet-scented Hakea—an erect shrub or small tree. The young shoots are silky-pubescent, the adult foliage glabrous, the leaves terete, erect,



Leaves and Flowers of *Hakea sericea* (Silky Hakea)

3 or 4 inches long, but usually pinnate with few or many upright segments of 1 to 2 inches all rigid and pungent-pointed, the white flowers small, in dense racemes in the upper axils, the reddish-brown fruit $\frac{3}{4}$ to 1 inch long, $\frac{1}{2}$ to $\frac{3}{4}$ inch thick, smooth and almost shining, generally marked with warts and having a small incurved beak.

HALFORDIA

(After Prof. G. B. Halford)

The genus has two species of evergreen trees native to southern and northern Queensland. They are both useful as substitutes for English Box.

Halfordia drupifera (Plum-like): A small tree called "Ghittoe," also Halford's Purple Plum on account of its bluish-black fruit which is a rather succulent drupe about $\frac{1}{2}$ inch long. The leaves are alternate, simple, lanceolate, and the flowers numerous in a panicle, the pale, rather heavy timber being tough, flexible, yellow, hard and durable.

Halfordia scleroxylon (hard wood), known as Kerosene Tree, is found in the scrub forests about Rockingham Bay, Queensland, and from the Evelyn River to Russell River, differing from *Halfordia drupifera* in having red fruit. It has very fine, hard, tough and durable timber, yellowish when fresh but turning brownish, free from knots, 60 lb. weight, but very inflammable even in a green state.

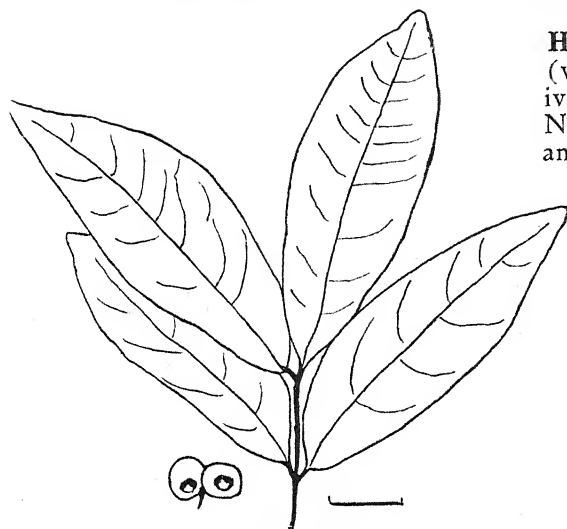
HARPULLIA

(Name of a species of Chittagong)

Besides the four Australian species, which are endemic, there are two or three others, natives of tropical Asia and Madagascar. The Australian species are found in the Queensland scrub forests and the north coast of New South Wales.

Harpullia alata (winged), known as Winged Tulip Wood and native to New South Wales and Queensland, a tree 60 to 80 feet high. The branchlets six to ten to each leaf are oblong, elliptical or lanceolate 3 to 6 inches long, the capsule two-lobed 1 to $1\frac{1}{2}$ inches broad, the seeds one or two in each lobe are enveloped in a yellow arillus. The wood is light coloured.

Harpullia Hillii (after Walter Hill): A tree of 30 or 40 feet, growing in the northern scrub forests, with grayish bark, and pinnate leaves with six to ten leaflets 3 to 6 inches long, and flowers in loose, slender, terminal panicles, the fruit yellow or reddish, smooth and two-lobed. The wood is hard, close-grained, heavy, works well, and has very strong dark-brown markings on a light ground; it is admirable for turnery, cabinet-work, ornamental boxes, picture-frames, salvers, etc.

*Harpullia pendula*

Harpullia pendula (weeping): A native of northern New South Wales and Queensland. A large, glabrous tree with leaflets three to six from ovate to elliptical-oblong 3 to 5 inches long. The wood is close-grained, firm and beautifully marked with different shades from black to yellow, esteemed for cabinet-work.

Its height is 50 to 60 feet, with a 1 to 2-foot diameter.

HEDYCARYA

(Fruit of one species sweet)

Besides the Australian species which is endemic, there is one in New Zealand and another in the Islands of the South Pacific.

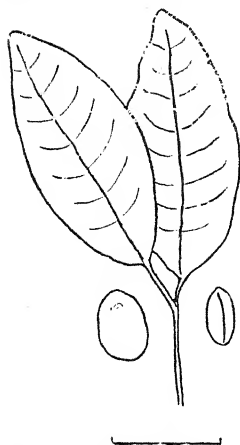
Hedycarya angustifolia (leaves narrow): A small tree, growing up to 20 feet high in Victoria, New South Wales and Queensland, known as the Smooth Holly or Native Mulberry; it has greenish-yellow flowers. The wood is light, close-grained, tough and useful for cabinet-work. The aborigines use it for spear-ends.

HELICIA

(Snail shape)

The genus is spread over tropical Asia extending northwards to Japan. The three Australian species are endemic. They occur in Queensland and northern New South Wales and are known as Nut Trees.

Helicia praealta (very high), known as Scrub Honey-suckle, it supplies a timber of pinkish colour, close-grained and nicely marked, which is recommended for cooper's work as well as cabinet-work. It is native to New South Wales and Queensland.



Hemicyclia australasica
(Leaves, fruit and seed)

HEMICYCLIA

(Semi-orbicular stigma)

The genus contains but few species dispersed over the East Indian Peninsula, Ceylon, and the Eastern Archipelago. Of the two Australian species, one occurs in India also, the other is endemic.

Hemicyclia australasica (Australian), known as Yellow Tulip Wood and Bushman's Razor-Strop Wood, grows to 40 or 50 feet high in New South Wales and Queensland, found from Port Macquarie northwards, with timber hard, firm and close-grained, useful for turnery and wood-engraving.

Hemicyclia lasiogyna (hairy fruited): Found at Port Darwin and Port Essington, Northern Australia, this tree has the habit of *Hemicyclia australasica*, but the leaves are usually larger, two or three lines long, and larger flowers, solitary, or few together, with perianth-segments mostly fringed and ciliate.

HERNANDIA

(After Dr. F. Hernandez)

The genus contains but few species, chiefly maritime, extending over the tropical regions of the globe. It has two Australian species.

Hernandia bivalvis (two valves), is known as Queensland Grease-Nut Tree on account of the large quantity (64.8 per cent.) of oil contained in the seeds. This oil is very similar in consistency and smell to the common laurel oil; the shells contain a dye which is soluble only in soda. It is a tall tree, confined to Queensland, where the aborigines call it "Cudgerie," a name also given to *Flindersia australis* by the aborigines of the northern rivers of New South Wales. Like many Queensland trees it flowers while still of shrub size; the timber is dark-gray, close-grained, light and soft, suitable for lining-boards and similar purposes.

Hernandia peltata (shield-shaped): A coastal tree of tropical Queensland with a large spreading head, the yellowish flowers very slightly hoary-tomentose, and leaves on long petioles broadly ovate acuminate five to nine nerved, the larger ones about a foot long. The seed is very hard, $\frac{3}{4}$ inch in diameter, and the wood dark-gray in colour, close-grained, light and soft; suitable for carriage-brakes, lining-boards and similar uses.

HYMENOSPORUM

(Seeds winged)

The genus is limited to a single species, endemic to Australia.

Hymenosporum flavum (yellow flowers): This species grows in the east coastal, scrub forests, an erect, small tree attaining 60 to 70 feet at its highest in the north (Eungella Range) and on the Atherton Tableland, Queensland, from the Hunter River, New South Wales. It has ovate-oblong, alternate leaves 3 to 6 inches long; large, strongly-scented, yellow flowers over 1 inch long in terminal panicles, and flattened, thick seed-capsules with numerous flat winged seeds. Its popular names are Native Frangipani (on account of its scent), Yellow Coin-Pod Tree and Wing-seed Tree. It has pale, non-resinous bark and whitish timber, close and fairly tough, 43 lb. in weight, seasoning and working well, with no sapwood, and suitable for small cabinet-work. An ornamental tree for gardens.

IXORA

(Named after Iswara)

A large genus, widely spread over tropical Asia and Africa. Three Australian species are found in New South Wales and Queensland.

Ixora Becklerii (after Dr. Beckler), a small tree, known as Bird's-eye on account of its wood, which has its range from the Clarence River, N.S.W., to Atherton, Queensland. It has a hard, firm, close and straight-grained timber of a dark colour streaked with yellow, weighing 55 lb. per cubic foot, small, but used for turnery, tool-handles, etc.

JACKSONIA

(After G. J. Jackson)

A genus of ten species in Australia.

Jacksonia scoparia (Broom-like): a small tree, almost leafless, with yellow flowers in one-sided racemes, either terminal or from the upper nodes. The fruit is flat, oblong, four to six inches long. It is found from the Brisbane River to Cairns, Queensland, and known as Dogwood. The wood emits a most offensive odour when burning. It weighs 56 lb. per cubic foot.

LAGUNARIA

(After A. Laguna)

A genus limited to a single species.

Lagunaria Patersonii (after Colonel Paterson), growing 30 to 40 feet high, and called Queensland Pyramid Tree on account of its unusual shape, and also White Wood because of its white timber, which is close-grained, easily worked, and useful for building purposes. It is an ornamental tree with oblong-ovate, entire leaves, 3 to 4 inches long, and rose or creamy flowers, and fine hairs growing inside the fruit. It is found in New South Wales, Queensland, and in Norfolk Island is known as the Cowitch Tree, and is cultivated extensively in parks and gardens for its decorative qualities.

LAPORTEA

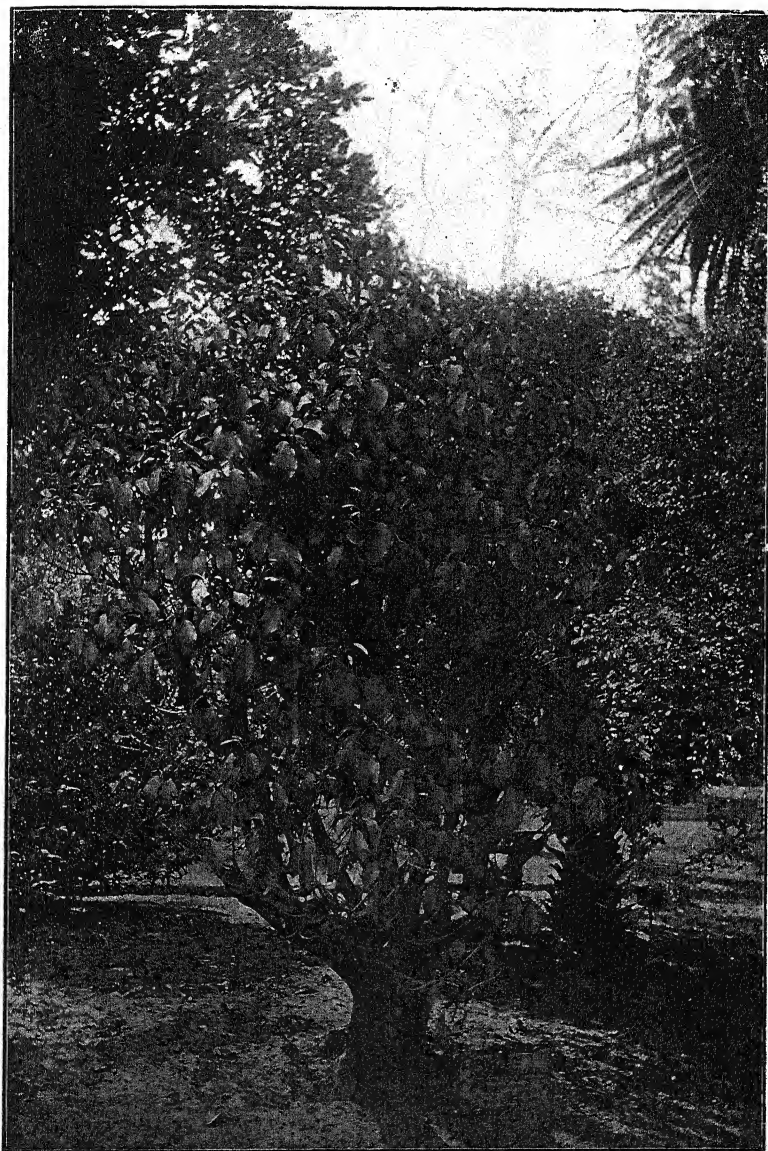
(After M. Laporte)

The species are distributed over the warmer regions of the new world, but chiefly in the Indian Archipelago and Pacific Islands. The three Australian species are endemic. The genus is an interesting one.

Laportea gigas (large): A partly deciduous tree which grows to a height of 80 or 100 feet, with a diameter up to 4 feet. It is called the Giant Nettle Tree, having very large and broad, dense, heart-shaped leaves up to 12 inches long, which, as well as the branchlets, are hairy on the younger trees and exude a poisonous, stinging fluid causing great pain to human being if touched, so it is well named the "Touch-me-not" Tree. It is found in the southern scrubs of Queensland, and also in New South Wales. The wood is brownish and spongy, considered valueless, but the inner bark especially from the roots has a useful fibre.

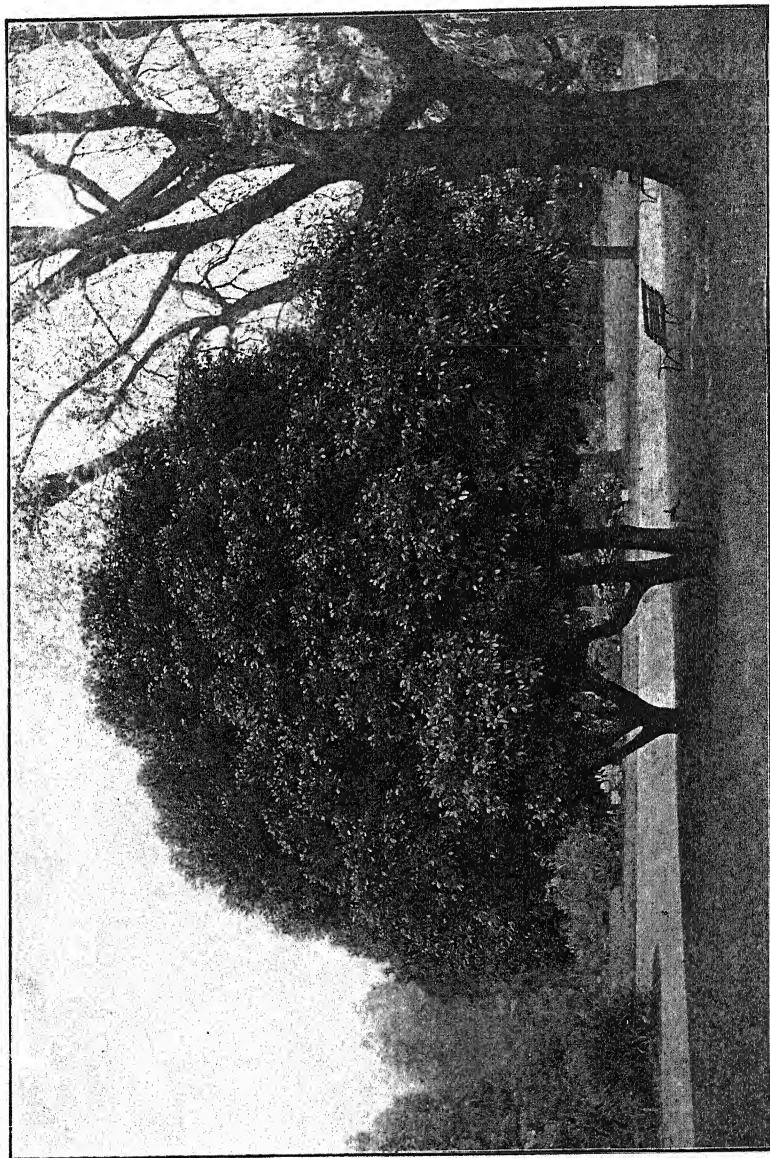
Laportea photiniphylla (shining-leaved): A tree growing 60 to 90 feet high in the coastal scrub-forests from southern New South Wales to northern Queensland, one of the commonest in the rain forests on the ranges and foothills of the Varina district, Queensland; it has small shiny leaves with fewer but rather stouter and more rigid, stinging hairs than the former species. The wood is soft and brownish, used for floats for fishing-nets.

Laportea moroides (Mulberry-like): A small tree, with very virulent stinging hairs on the large leaves, and found in northern New South Wales and from the Brisbane River to the Barron River, Queensland, growing 15 to 20 feet high, and reputed injurious to stock. The inner-bark yields a good description of fibre, used by the aborigines for cordage, fishing-nets and dilly-bags.



W. R. Guilfoyle, photo.

Laportea photiniphylla (Nettle Tree)



W. R. Guilfoyle, photo.

Litsea ferruginea (Rusty Litsea)

LINOCIERA

(After G. Linocier)

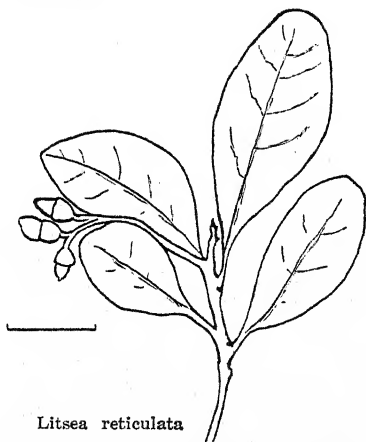
A genus of three species in Australia.

Linociera ramiflora (flowers upon the branches) is a glabrous tree of considerable size, with leaves broadly elliptical-oblong 6 to 9 inches long, and flowers in panicles axillary or below the leaves, branching into three divisions, the ovoid fruit often $\frac{1}{2}$ inch long. This tree is found at Rockingham Bay and on the ranges near Rockhampton.

LITSEA

(Japanese name)

The species are chiefly tropical, the six Australian ones endemic.

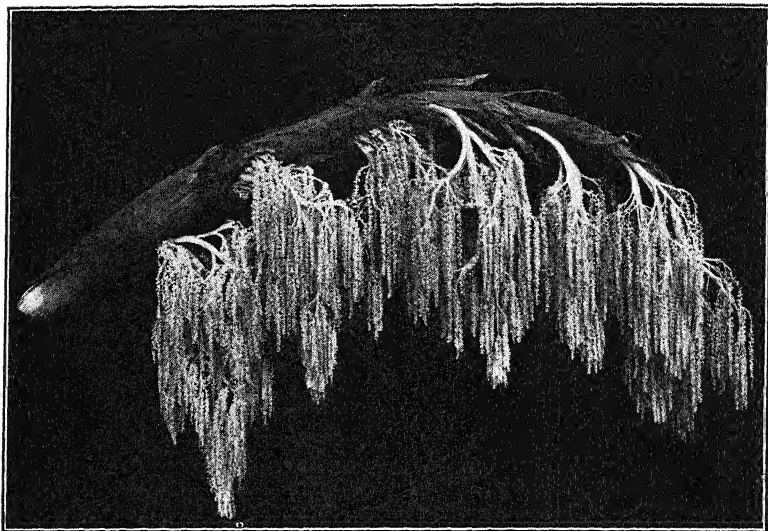


Litsea reticulata (netted veined): A tree growing to 120 feet high with a 5-ft. diameter, often flanged at the base, glabrous except for the flowers and young shoots, with thin obovate-oblong leaves 3 to 4 inches long, and purple, ovoid fruit. Found from south of Gosford, New South Wales, to Rockingham Bay, Queensland, and known as "Cudgerie." Its wood is of a gray colour, close-grained, light, and easy to work; suitable for flooring-boards.

Litsea dealbata (whitened): A well-known tree of Queensland and New South Wales called Native Mulberry or Pigeon-Berry Tree, usually slender, growing to 30 feet, but has been found 60 to 80 feet high, with fine leaves prominently veined, pale underneath, and reddish-purple aromatic fruit; the yellowish-white wood is fragrant, tough and sound, with a nice grain of short brown streaks, useful for indoor work.

Litsea ferruginea (rusty-haired): A tree 50 feet high common in the scrubs from the Bellinger River, New South Wales, to the Endeavour River, Queensland. It is known as Rusty-leaved Litsea, Brown Bolly Gum, or White Sassafras. Its leaves are from broadly ovate to elliptical oblong, 3 to 5 inches long, glabrous and shining above, hairy underneath with raised primary veins. The wood is of a pale-yellow colour, close-grained and easily worked.

Litsea zeylanica (of Ceylon): A large tree with branches and inflorescence quite glabrous, the leaves ovate-elliptical, 3 to 5 inches long, and berry globular. It has a faintly aromatic timber and is found north of Gloucester, New South Wales, and in Queensland. This species has a wide range over tropical Asia. The wood is pale yellow, light, close-grained and easily worked, and occasionally used for slabs for buildings.



N.S.W. Government Printer, photo.

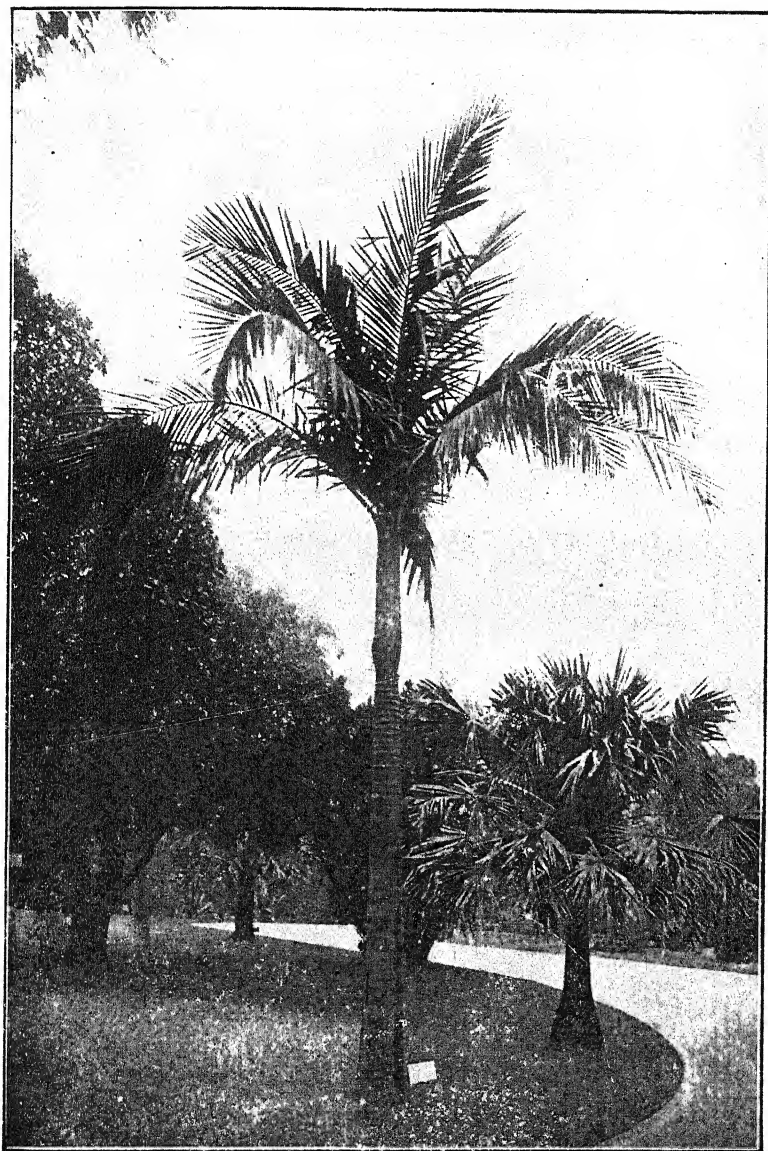
Flower of *Livistona australis*.

LIVISTONA

(After Baron Livistone)

There are four Australian species of this Palm which are endemic, and about twelve species in Asia and Indian Archipelago. They are trees with a large crown of broad regularly-divided leaves, the small flowers in large spike clusters, and the fruit a hard drupe.

Livistona australis (Australian): A tall slender tree known as Austral Cabbage-tree Palm or "Konda," attaining 50 to 80 feet or even more. The leaves are in a dense crown, the flowers small and numerous in spikes at the ends of the branched clusters; and the fruit round six to nine lines diameter, seeds globular and dark-coloured. The wood, or outer part of the



W. R. Guilfoyle, photo.

Archontophoenix Cunninghamii (Illawarra Palm)

stem, is fairly hard, of a dark colour, and prettily marked, and is used by the aborigines for making spear-heads. This Palm is tropical and sub-tropical in habitat, but is found in small groups in two or three places in East Gippsland, Victoria. There is much conjecture as to how it came there. Some people hold the view that the seeds were brought by birds from the northern States, where it is plentiful in the scrub-forests—others are of opinion that the seed was brought by the aborigines.

THE COMING OF THE PALMS

Livistona

*"Swift winged from the North the strong birds came
And rested where a mountain stream laughed by
And to its music gave their voices high
And clear, when sunset left the trees aflame.*

*"Dark fell, night passed; the wandering birds sped on,
Save one, that, wounded, died, nor never knew
It left a gift of seed. Beneath the blue
Clear heaven it rooted when the birds were gone.*

*"Young leaves put forth from it, upspringing there—
Leaves of strange palms no southern valley knew—
Palms of the North that clustered fair and few
And whispered with the wind who knew how rare
Their slender columns and wide fronds that spread
A roof of singing o'er the streamlet's bed."*

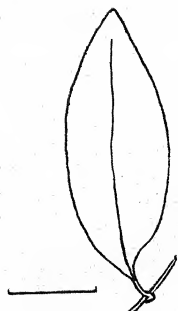
—J.G.

LUCUMA

(Peruvian name)

The greater number of the species of this genus belong to South America and the West Indies. There are five species indigenous to Australia.

Lucuma Amorposperma (generic name), known as Silky Hornbeam or Brown Pearwood, is a tree reaching to 60 feet, found from the Tweed River, New South Wales, to near Bowen, Queensland. The bark is grayish-brown, marked by rounded, slight depressions and exuding when cut a bright-red milky juice. The wood is useful for indoor fittings and cabinet-work.



Lucuma
Amorposperma

Lucuma chartacea (thin leaves): A small tree growing from Palmwoods to Innisfail, Queensland, with leaves lanceolate to obovate-oblong 2 to 4 inches long, flowers small, sessile, in dense axillary clusters, the fruit oval-oblong, slightly tapering at the base, purple, about an inch long. The wood is light-yellow, somewhat resembling English Birch; close in grain, firm and useful for cabinet-work.

MABA

(Aboriginal name)

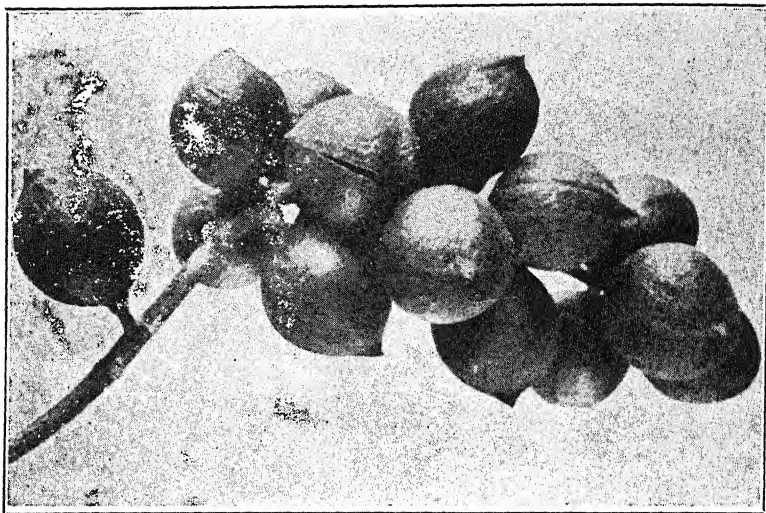
The genus extends over the tropical regions of the Old World and the Indian Archipelago, also the Islands of the South Pacific. There are ten species native to Australia. The trees are all glabrous and chiefly found in Queensland and North Australia, one occurs in New South Wales.

Maba fasciculosa (clustered flowers), known as Queensland Ebony and found in the Rockhampton district, Queensland, and the north coast of New South Wales. This tree is about 50 feet high usually, but occasionally grows to 100 feet. The leaves are alternate, elliptical, blunt at the apex, 2 to 5 inches long and about half in width, the oval fruits in groups in the forks of leaves. The wood is pale-pinkish with black specks and streaks, close and straight-grained, strong and elastic, 51 lb. in weight, and good for carriage-work and general purposes, and found suitable for carving.

Maba geminata (fruit often in pairs) is found from Southport to Bowen, Queensland, 50 to 60 feet high, having timber bright-red with black centre, which takes a high polish and is good for veneers.

Maba humilis (low) is found on the sandstone ridges and along the beaches of the North Kimberleys and in the forests of the north-west of Western Australia, also in the scrubs of Queensland, growing to 30 feet, with numerous short branches, dense foliage, ovate fruit, and light-gray bark. Its timber is hard, tough and strong, the heartwood deep black, contrasting with the yellow or white and pink sapwood, of great beauty, and useful for small cabinet-work and tool-handles.

Maba laurina (Laurel-like): A small tree native to Queensland, 15 to 20 feet high, with ovate-oblong and obtusely acuminate leaves; it has yellowish-white flowers and edible green berries. The wood is hard and tough and useful for mallet and chisel handles, also for carving or wood-stamps.



Sydney Mail, photo.

Fruit of the Queensland Bush Nut Tree

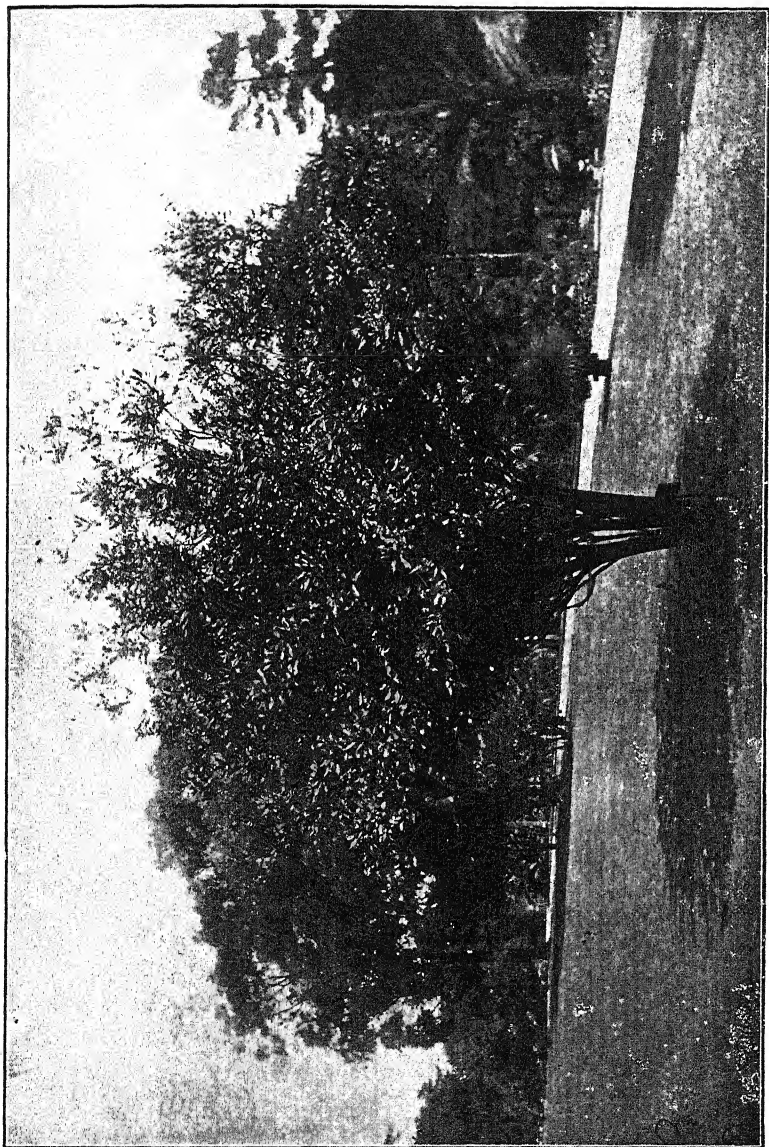
MACADAMIA

(Surname Macadam)

The genus of six species is endemic to Australia. The Queensland Bush Nut Tree (*Macadamia ternifolia*) has an economic value that is worth considering.

Macadamia praealta (very high), known as Scrub Honey-suckle, Ball or Opossum Nut, or Beefwood, and growing in the southern scrub forests of Queensland, generally on the mountain sides, sometimes lofty but usually about 60 feet high; it has rather rough but not fissured brown bark, narrow alternate lanceolate leaves mostly 6 to 10 inches long, flowers in narrow racemes, and thick clusters of globular nuts 1 to 2 inches in diameter but of no importance. The wood is red and nicely marked, close-grained, tough, strong and durable, useful for indoor fittings, cabinet-work and tool-handles, etc.

Macadamia ternifolia (leaves in threes): A fair-sized tree of 40 to 60 feet high, with flowers in long, narrow, drooping racemes up to 10 inches long, fruit 1 inch in diameter, and it is one of the few Australian trees having an edible nut of excellent flavour and food value. Claimed to rival almonds, walnuts, or the Cashew nut, the food value in 1 lb. of nuts is very high, but the shell is exceedingly hard. This tree has been recommended for cultivation for its nuts, a thinner-shelled



W. R. Guilfoyle, photo.

Macadamia ternifolia (Queensland Bush Nut Tree)

strain being chosen for the purpose, and also for its ornamental timber, which is very hard and heavy (75 lb.), very tough, strong, and close-grained, chocolate in colour with a prominent ray figure, of a greasy nature, taking a good polish, and suitable for constructional work requiring strength, also heavy cabinet-work, waggons, bullock-yokes, staves, shingles, etc.; the sap-wood should be removed as it attracts the borer insects. It makes a good shelter tree and is worthy of cultivation in gardens, taking approximately seven years to bear fruit from the time of planting, but young trees may be successfully transplanted during the winter months. The tree is too valuable to be used for timber, as the nuts are of more commercial value.

Macadamia Whelani (after E. J. Whelan) is endemic to Queensland, and grows to 25 or 30 feet high, with a larger nut than *Macadamia ternifolia*. Investigations for economic uses are being carried out on this nut.

MEDICOSMA

(Having the odour of lemons)

The genus is limited to a single species endemic in Australia.

Medicosma Cunninghamii (after A. Cunningham), the Glue-Gum Tree, also known as Bonewood or Pinkheart, and growing on the east coast of Australia from the Clarence River, New South Wales, to Maryborough, Queensland. Its height is from 30 to 50 feet, and the leaves are opposite, 3 to 5 inches long, the large white flowers in panicles. The wood is very close-grained, brittle, light-yellow with a dark heart, tough to dress but useful for heavy cabinet-work.

MELIA

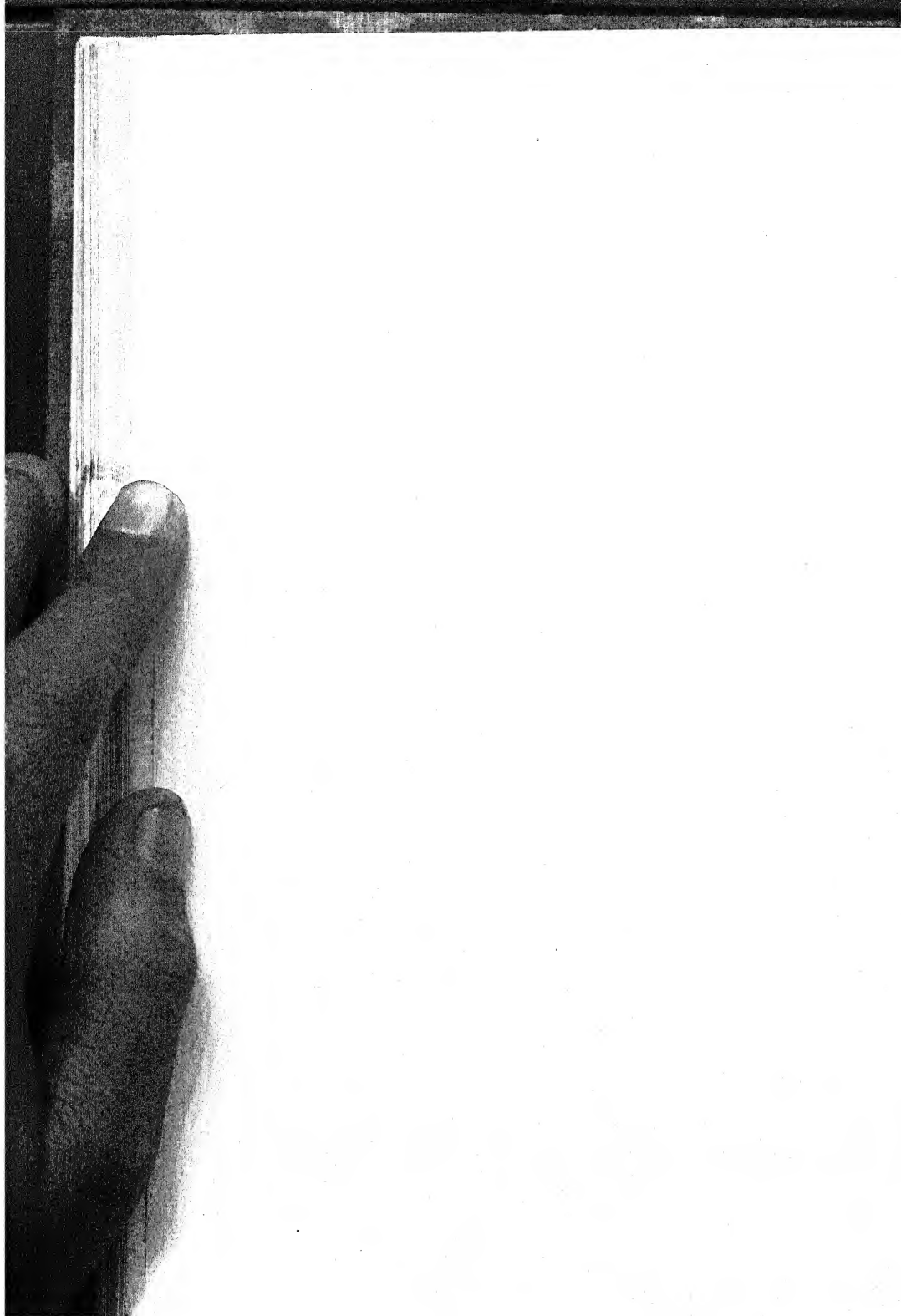
(The Manna Ash)

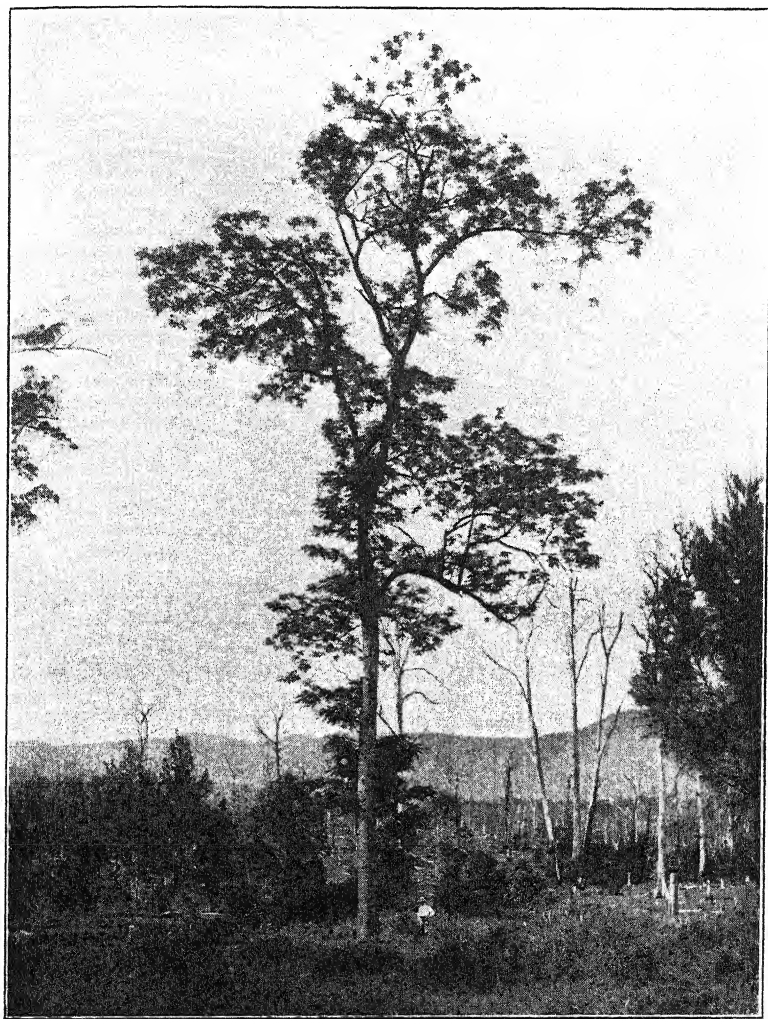
The genus comprises very few species, chiefly natives of tropical Asia. There is only one Australian species.

Melia Azedarach (an Arabic name) is popularly known as the White Cedar and well known in Australia and New Guinea, growing naturally in the coastal scrubs of northern New South Wales and Queensland, extending northward from a little above Sydney. Its fairly large, loose panicles spring from the forks of the leaves which are long, pendulous, alternate, twice-pinnate with numerous, serrated leaflets 1 to 3 inches long and about half in width. It is an excellent tree for street planting, being deciduous but highly ornamental, especially when in flower or fruit. The timber is light in weight and colour, soft, open in



Harpullia pendula
(Tulip Wood)





N.S.W. Government Printer, photo.

Melia Azedarach (White Cedar)

the grain and very easily worked, very durable, polishes well, and is prominently marked with large, wavy, annual rings, similar in figure and texture to English Elm, pale-yellowish when unpolished and warm brown when polished. (It is good for cabinet-work, turnery, veneering, etc., and any inside but not outside work. The tree is easily propagated from seed and grows fairly rapidly.)

MELICOPE

(Glands of the flower notched)

A genus of which—besides the seven Australian species which are endemic—there are two in New Zealand and a few in the Pacific Islands.

Melicope australasica (Australian), is known as Soapwood and becoming very scarce. It is a handsome glabrous tree 50 feet in height with three-foliolate leaves 6 to 10 inches long and numerous small white flowers. It grows in the area from the Clarence River coastal scrubs to Macpherson Range, Queensland, where the taller trees have a white, variegated bark.

Melicope erythrococca (reddish berries): A lofty tree with a smooth whitish bark quite glabrous. The timber is of a delicate light-canary colour, resembling English Box but lighter-coloured and freer from knots, rather heavy for cabinet-work being 59 lb., but otherwise very suitable, having a pretty small figure, rather open in the grain. The bark possesses a most peculiar acrid pungency.

Melicope melanophloia (black-barked) grows from east of Gympie to Fraser Island and reaches in some instances to 100 feet high with a diameter up to 27 inches. It has black bark and a very hard and dark (almost black) wood, with white sapwood.

Melicope neurococca (referring to the nerves of the cocci): A small tree, found from the Hastings River, N.S.W., to Maryborough, Queensland. Its wood is very hard and close-grained, and of a uniform light-yellow colour, and used for handspikes and levers.

MIMUSOPS

(Flowers ape-face like)

The genus is dispersed over the tropical regions of the globe extending into extra-tropical South Africa. There are two Australian species which extend to India.

Mimusops Browniana (after Dr. Robt. Brown) is found on the east coast of Queensland, a tree of irregular growth with fine red wood which is easy to work.

Mimusops parvifolia (small leaves): A stout, bushy tree, also of Queensland, 30 to 40 feet high inland but very low on the sea-coast. The wood is of pinkish colour, close in grain and easy to work. It is closely allied to an Indian species, *M. Elengi*, differing chiefly in the pubescence, the longer peduncles, smaller flowers, and narrower segments.

MOLLINEDIA

(After Francis Mollinedo, a Spanish chemist)

The genus is numerous in tropical America. There are seven Australian species, which are endemic.

Mollinedia Huegeliana (after Baron C. von Huegel) is found in the coastal districts of Queensland, from Kiama to the Belenger Range south of Cairns, a small tree up to 25 feet high, with flowers, undersides of leaves, and the young shoots hairy. The timber is fairly hard and close-grained, with prominent rays, firm to work, weighing 47 lb., and somewhat resembling the English Sycamore. It is prettily marked, suitable for cabinet-work and ornamental turnery.

MORINDA

(Referring to the Mulberry Tree)

A considerable tropical genus, chiefly Asiatic or African, with two or three American species. Of the six Australian species one is common in tropical Asia, another is widely distributed over the sea-coasts of southern Asia and the Pacific, the four others are endemic.

Morinda citrifolia (Citron-leaved): A small tree 50 to 70 feet high (called variously Canary Wood, Awl Tree, Leichhardt's Bush Mulberry), of Queensland and North Australia, also the Pacific Islands, Asia and Africa. The wood is yellow with a musk-like perfume, soft and close-grained, easy to work and polish, sometimes having a wavy grain even better than Satinwood. Its fruit, leaves and roots are used for various purposes in India, and cotton and woollen fabrics have been dyed with bark from the root of this tree in Queensland.

Morinda jasminoides (Jasmine-like): A small tree of 15 to 20 feet high, known as Jasmine Morinda, having white flowers, growing in Victoria, New South Wales and Queensland, with yellow, prettily marked wood.

MYOPORUM

(Shut pore)

A genus of about twenty species, most of them Australian; a few species are found in the Indian Archipelago and the Pacific Islands, and one species in tropical Africa. They have rather large leaves, seldom opposite, white flowers with coloured dots, growing singly or in clusters at the leaf axils, the fleshy fruit nearly round and of a good size; the name of Poison Bush is applied to some species.

Myoporum tenuifolium (slender leaves): One of the trees of the genus, reaching 30 to 40 feet in height and with rather long and thin-textured leaves; the white flowers are sparse and axillary; the fruit mostly ovate-globular. It supplies a soft and rather light (47 lb.) but tough timber used for building purposes.

Myoporum montanum (belonging to mountains), known as Water-bush, is a small, slender tree occasionally 30 feet high, with a diameter of 18 inches. The timber is soft and moderately light, and useful for building purposes. It weighs 47 lb. per cubic foot.

Myoporum insulare (belonging to the Islands): A tree growing to 30 feet and having a fleshy, purplish fruit. The wood is hard, white and durable. This tree is known as "Boobyalla." Native to all the States except Queensland and North Australia.

Myoporum platycarpum (broad fruit): A small tree of 15 to 20 feet, growing in Victoria, New South Wales, South and Western Australia, known as Sandalwood, Sugarwood, and Dogwood, attractive, with an abundance of white, sweetly-scented flowers. Its leaves are eaten by stock and its resin used by the aborigines as cement. The wood possesses a very pleasant perfume when freshly worked, and is suitable for veneering and cabinet-work, taking a fine polish.

Myoporum serratum (serrated): A small tree 15 to 30 feet high, native to Western Australia and called Cockatoo Blueberry Bush because those birds delight in its saltish-tasting berries. The wood is hard, white, and durable when unexposed to atmospheric influences. It has been used for inlaying.

MYRISTICA

(Nutmeg odour of the fruits)

The genus is entirely tropical, abundant in the Eastern Archipelago, with a few species in India and South Pacific Islands and several in tropical America. There is only one Australian species.

Myristica insipida (tasteless), known as the Australian Nutmeg, grows in Queensland and North Australia up to 60 or 80 feet high; the seeds, which are surrounded by red mace, are quite insipid and not aromatic. The wood is pinkish-gray, tough but easily worked.

MYRSINE

(Ancient name of Myrtle)

A considerable genus, spread over the tropical and sub-tropical regions of the world. The five Australian species are endemic.

Myrsine Howittiana (called after Dr. A. W. Howitt, the noted geologist and botanist of Victoria, who was commissioned to go to Central Australia in 1864 to recover the bodies of Burke and Wills): A glabrous tree 30 to 40 feet, or even 50 feet high, growing on the whole extent of the eastern coast from southern Victoria to northern Queensland; the leaves are scattered, dotted and streaked, occasionally warted, the small, greenish flowers on stalklets, and the light-coloured wood moderately hard, tough and durable and very suitable for cabinet-work and small furniture. Known as Turnipwood.

Myrsine crassifolia (thick-leaved): A small glabrous tree of 15 to 20 feet high, growing in New South Wales and Queensland. This tree is closely allied to *Myrsine capitellata*, an Indian species. The wood is yellowish, hard, tough, and durable, and in grain somewhat like the British Oak.

NEPHELIUM

(Ancient name for Burdock)

The genus is widely distributed over tropical regions, but less numerous in America than in Asia. There are about twelve species in Australia and they grow from 20 to 80 feet high, in New South Wales and Queensland.

Nephelium Beckleri (surname Beckler): Indigenous to Queensland, from Port Macquarie to Gympie, called "Coogera" by the aborigines, a fine decorative tree with hoary shoots and oblong-ovate leaves 2 to 4 inches long, and glabrous fruit. It grows to 70 or 80 feet, its hard timber having yellow heartwood, and white sapwood.

Nephelium foveolatum (deeply pitted): A typical species of the genus and a splendid scrub tree of considerable size, in Queensland, with rusty young branches and flowers. It has an ornamental timber.

Nephelium tomentosum (woolly): The Woolly - leaf Nephelium of the north coast of New South Wales into Queensland, from Clarence River to Proserpine, and inland for 100 miles in Queensland. It is sometimes cultivated as a shade and ornamental tree, and grows from 20 to 50 feet high.

Nephelium Lautererianum (after Dr. J. Lauterer): A tall, erect tree with spreading head, smoothish bark, the trunk attaining a diameter of 1 to 2 feet. The leaves are alternate pinnate, glossy, narrow-lanceolate in outline, the flowers small in

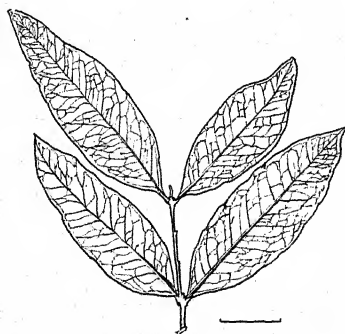
slender, widely-branching panicles near the summit of the branchlets, the wood close-grained, hard, heavy, but easily worked and useful for mallets and tool-handles. It occurs in Queensland.

NOTELAEA

(Southern Olive)

A genus of six species limited to Australia—all the species being very closely allied to each other. The leaves are firm, opposite and entire, the blades narrowed at both ends and with prominent veins, and are regarded as good fodder plants for stock in some districts but not in others. The flowers are small, in short, simple racemes, and the fruit is a berry with one seed.

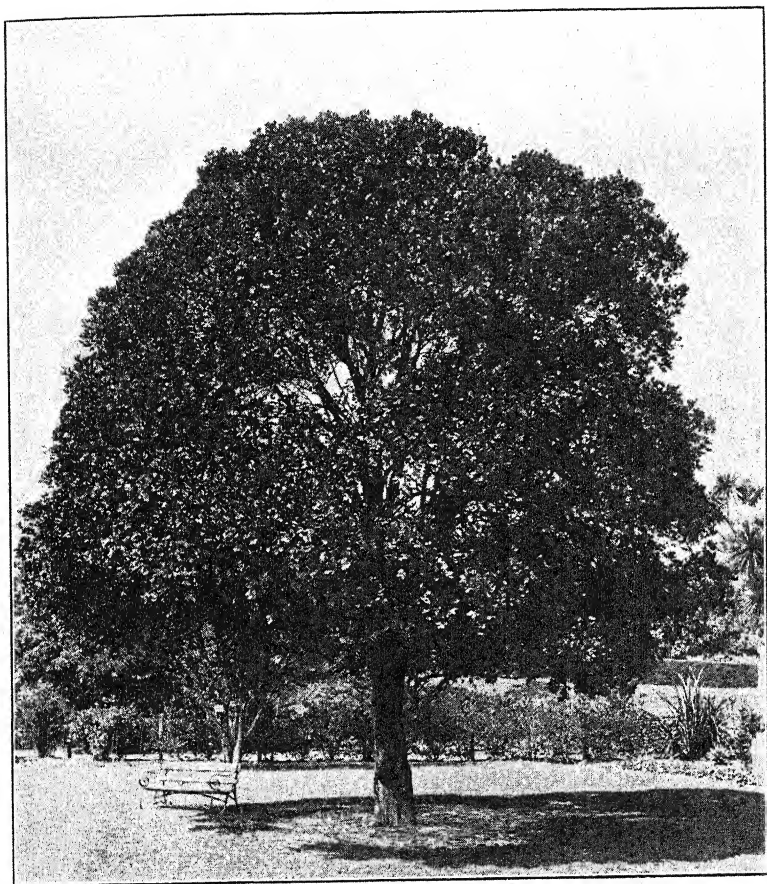
Notelaea ligustrina (always restricted to forest valleys): A small tree 30 to 40 feet high, growing in southern Queensland, the South Coast district and the Dividing Range of New South Wales, to Victoria and Tasmania. It has hoary, young shoots, narrow lanceolate leaves, yellowish flowers in racemes, and almost globular fruit varying from white to red and nearly $\frac{1}{2}$ inch in diameter. It is known as Privet Mock Orange, also Ironwood and Axebreaker, having a very hard, almost white timber resembling that of the American Sycamore and 59 lb. in weight. It is suitable for mallets and domestic utensils of the harder kind, also coachwork, and has a sheen like Silkwood when polished.



Notelaea longifolia

Notelaea longifolia (long-leaved): A small bushy tree, 20 to 40 feet high, of Victoria, New South Wales and Queensland from East Gippsland to the Atherton Tableland. It has yellowish flowers, leaves 2 to 6 inches long with prominent veins, and black or bluish, egg-shaped fruit. Its wood is of a light colour, hard, tough, and close-grained. This tree is commonly known as Long-leaf Bluebush and by its aboriginal name of "Coobagum."

Notelaea ovata (ovate leaves), the Queensland Olive, growing to 15 or 20 feet high in New South Wales and Queensland, and of a rather crooked growth. Its wood is used for tool-handles, and is hard, close-grained, and firm.



N.S.W. Government Printer, photo.

Nephelium Beckleri ("Coogera")

Notelaea microcarpa (small fruit) : A small tree, 20 to 30 feet high, of New South Wales and Queensland. It has wood of light colour, dark towards the centre, close-grained and very hard, is used for mallets, sheaves of blocks, turnery, etc.

NOTHOFAGUS

(Spurious Beech)

A genus of four species. None of the *Nothofagus* timbers resemble the Beech of northern latitudes, though the Tasmanian *Nothofagus Cunninghamii* is a true Beech in its utility.

Nothofagus Cunninghamii (after A. Cunningham): This tree reaches over 100 feet high with a diameter up to 4 feet, growing on the ranges of Victoria and Tasmania, being one of the largest trees, with wide-spreading branches, of the west and north-west of Tasmania, where the climate is humid. At Marysville, Victoria, some of the most robust of this species of Native Beech have been found—the largest being 12 feet in diameter and 40 feet in circumference. This species is not considered altogether a satisfactory tree, being very susceptible to fire and having a tendency to throw up many shoots from the stem, resulting in low timber yield, and the trunks are sometimes covered with epiphytal ferns, and fungi is found on its branches. The sapwood, which is very sensitive to the borer insects, is not easily discriminated from the heartwood. It has very dense foliage, the leaves being broadly ovate, flat or slightly convex, rough, $\frac{1}{4}$ to 1 inch long, the fruit about $\frac{1}{4}$ inch long with one or more winged seeds. The timber is reddish, soft, close-grained, works easily and polishes well, light in weight, a good cabinet and joinery timber, also a good carving wood. Synonym: *Fagus*.

Nothofagus Moorei (after C. Moore) is known as Moore's Negrohead Beech, so called from the rich dark colour of its foliage. It is a fine tree, sometimes over 100 feet in height with a clean trunk to 65 feet, and a bole diameter of $3\frac{1}{2}$ feet. It grows on the mountain slopes on the south coast of New South Wales, and on the elevated parts of the Macpherson Range, Queensland. It has small, dark-green, rough leaves, ovate or ovate-lanceolate, alternate, flat and tough, conspicuously veined and the margins toothed, the fruit opening in four valves. It is closely allied to *Nothofagus Cunninghamii*, and has a fairly hard, durable, close-grained timber, reddish-brown in colour, 62 lb. weight, used for slabs for culverts, joinery, coach-building, and cabinet-work.



Nothofagus Moorei

OCHROSIA

(Pale-yellow)

A small genus of six species in Australia, known as Wedge Apple. All are endemic but one which extends to New Caledonia and the Fiji Islands.

Ochrosia elliptica (leaves elliptical), the Scarlet Wedge-Apple, grows to 30 or 40 feet high in Queensland and also in the Pacific Islands. This species and *Ochrosia Kilneri* have a milky juice exuding from the pulp of the fruits, and in the other species from the bark when cut.

Ochrosia Moorei (after C. Moore): A slender, glabrous tree 25 to 30 feet high, native to the Clarence and Tweed River districts of New South Wales. The leaves are nearly opposite, narrow-oblong, 3 to 6 inches long, the yellow flowers in slender clusters and the scarlet fruit about 2 inches long and 1 inch broad, blunt and flattened.

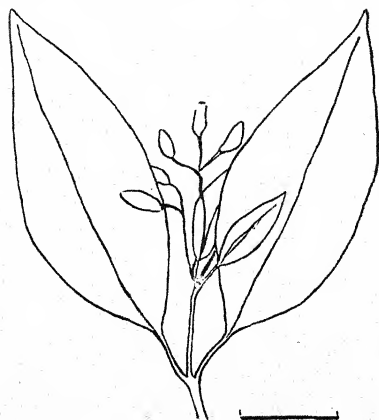
Ochrosia Cowleyi (after E. Cowley): A small tree found in Queensland. The leaves are in whorls of five, oblong, cuneate, shortly acuminate, 8 to 12 inches long and 5 inches broad, the flowers in panicles, the fruit elliptic-oblong, 3 inches long. A handsome tree worthy of cultivation.

OLEA

(Name of the Olive)

The genus is widely dispersed over the warmer regions of the Eastern Hemisphere with one North American species. There is only one Australian species, which extends to New Caledonia.

Olea paniculata (flowers in panicles), known as Marble Wood, Ironwood (the timber having a marble-like figure and being exceedingly hard) or Clove Berry, and called Maulwood on Lord Howe Island. It is a glabrous tree growing from 50 to 70 feet, occasionally up to 100 feet, in the coastal scrubs from the Hunter River, New South Wales, to Atherton, Queensland, also on Lord Howe Island and New Caledonia. Its glossy, dark-green, opposite ovate leaves on rather long petioles are 2 to 3 inches long, and white flowers small in loose panicles, the fruit blue-black, $\frac{1}{2}$ inch long, egg-shaped, fleshy, and its bark is grayish-brown and somewhat wrinkled. The heartwood of the timber is yellow with brown



Olea paniculata

streaks, the sapwood pale-pinkish, with a rose-like scent when freshly cut; it is rather difficult to work, being very hard, tough, and interlocked in the grain, but it is durable, occasionally

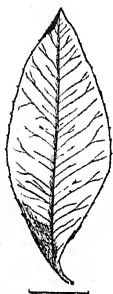
rather streaky, giving it is a marble effect, weighs 59 lb. to the cubic foot, and is suitable for staves and heavy rolling stock. The larger trees have buttressed trunks and all are ornamental and useful as shelter for stock.

OLEARIA

(Resemblance to the Olive)

The genus is limited to Australasia and endemic. It is, however, very closely allied to the extensive genus, *Aster*, widely distributed over the temperate regions of the Northern Hemisphere, especially in America. The species are mostly shrubs or under-shrubs and total about ninety. The leaves are scattered, rarely opposite or clustered, the corollas of the marginal flowers forming a whitish or bluish ray, and the fruits cylindrical or variously compressed.

Olearia argophylla (silvery-leaved): A tree of 20 to 30 feet in height with a 12-in. diameter, preferring moist, shady places in the rather restricted areas in which it is found in Victoria, on the south coast of New South Wales, and in Tasmania. Its popular names are Australian Musk Tree or Musk Wood. It is an elegant sylvan tree of musk scent, the back of the firm, serrated, ovate-lanceolate leaves 3 to 5 inches long, being silvery, silky, reticulate above the rather short headlets of white flowers, amply paniced and in terminal corymbs. The light-coloured bark peels off in strips; the wood is light-chocolate, of musk fragrance, not hard, with a straight, mottled grain, looking well when polished for ornamental articles and cabinet-work, the root stock being nicely figured. The weight of a cubic foot is about 40 lb.



*Olearia
argophylla*

ORITES

(Mountain plants)

The genus of three species is endemic to Australia.

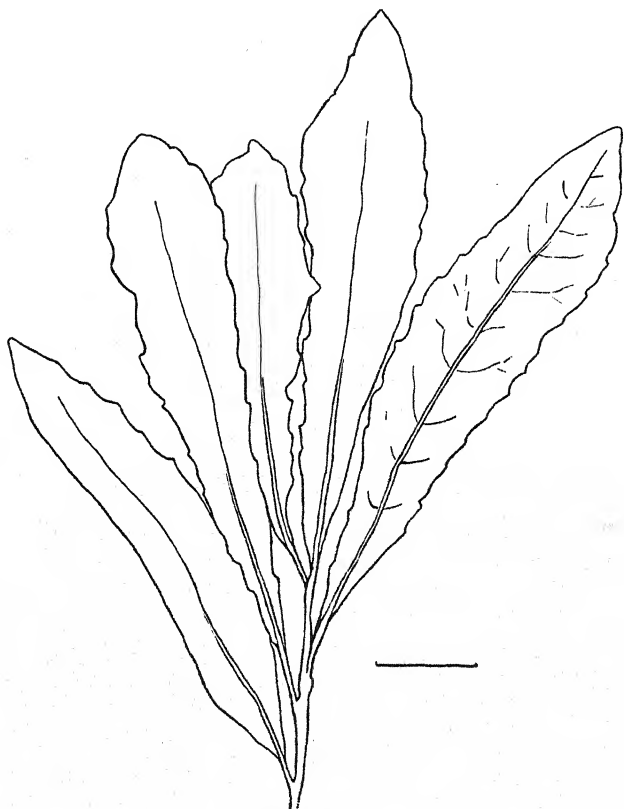
Orites excelsa (tall): A fine tree known as White Beef-wood and also as Red Ash and Prickly Ash, sometimes described for commercial purposes as Silky Oak, its timber being very similar to *Grevillea robusta*. It is a fairly tall and robust tree of the scrub forests on the coast of Queensland and the north coast of New South Wales, preferring the higher land such as Macpherson Range and Mount Mistake, Queensland; also found in New South Wales as far south as the Hunter River. It is usually 30 or 40 feet but sometimes reaches 100 feet. The bark is thin, smooth, and brown with a white coating; the



W. R. Guilfoyle, photo.

Olearia argophylla (Musk Tree)

leaves are alternate, 4 to 6 inches long, shiny above and glaucous beneath; the small white flowers in slender, axillary spikes, the fruit about 1 inch long with one or two winged seeds. The timber is hard, strong and durable, with a distinctive figure of large rays, light-brown in colour, and very suitable for office and shop fittings, general joinery and cabinet-work.



Orites excelsa

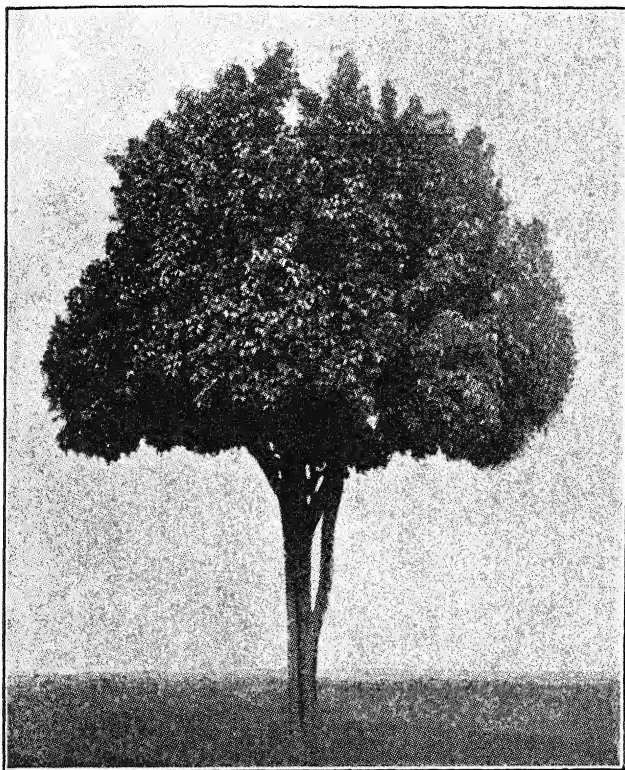
OWENIA

(After Professor Owen)

The genus of six species is endemic in Australia.

Owenia acidula (fruit acid), known as the Emu Plum, Sour Plum, Bushman's Tamarind, or Native Peach, grows to 40 feet high with a diameter up to 3 feet, found chiefly in

Queensland but also in New South Wales, North and South Australia. It is a very ornamental and good shade tree, with large, pinnate leaves, crowded at the ends of its pendulous branches, and small flowers in panicles, its red sub-acid globular fruit about the size of a nectarine. The timber is highly



W. R. Guilfoyle, photo.

Owenia venosa (Crow's Apple)

coloured from yellow to black with a bold, handsome figure, is durable and of great strength, and takes a good polish; useful for cabinet-work, but hard, heavy, and difficult to work.

Owenia cepiodora (Onion-scented), known as the Onion Wood of New South Wales, its timber having an onion scent when seasoned. It is a large brush tree reaching to 100 feet, growing northwards from the Clarence River, New South Wales, to the south coast districts of Queensland. It has large pinnate leaves with tapering or sharp points and six to twenty

leaflets, 2 to 5 inches long and about an inch broad, and small, globular, red fruit. Its timber is red, soft, easily worked, and takes a high polish, suitable for all kinds of cabinet-work, such as furniture, panellings, counters, etc., and very similar to Red Cedar but rather heavier and closer in the grain.

Owenia venosa (prominent leaf veins), known as Tart Plum, Crow's Apple, Tulip Wood, Rose Almond, growing to 30 to 70 feet high, and common in the drier scrub forests of the coastal area of Queensland as far as Rockhampton. The leaves are alternate pinnate 1 to 3 inches long, of six to nine leaflets, the flowers in slender panicles, the small, edible, red fruit is globular, the bark gray with brown patches and very scaly, and the timber useful for indoor work. Weight, 62 lb. per cubic foot.

PAGETIA

(After Dr. J. Paget)

The genus consists of two Australian species.

Pagetia medicinalis (medicinal), growing in Queensland from Brisbane to Rockhampton. It has prominently-veined, rounded or heart-shaped leaves, 3 to 5 inches long, whitish bark and numerous flowers in crowded cymes. The oil of the leaves is of medicinal value.

Pagetia monostylis (single styled), known to reach 60 feet in height (though this and the former species are usually small trees), is found at Eumundi, Queensland, differing from the others in having longer leaf-stalks and narrower leaves not heart-shaped at the base. The flowers also have only one style. A fair quantity of oil (which may have medicinal properties) has been obtained from the foliage.

PENNANTIA

(After Thomas Pennant)

The one Australian species is endemic—there is one also in Norfolk Island and another in New Zealand.

Pennantia Cunninghamii (after A. Cunningham), known as Brown Beech, Wheelwood, or Truckwood, is common in the coastal scrubs from Illawarra to the northern rivers of New South Wales and about Macpherson Range, and Mount Mistake in Queensland, usually found on creek sides. It is a large, ornamental tree growing to 80 feet high, and a diameter of 3 feet, with flanged base, and rather scaly, gray or brown bark, elliptical, entire leaves 4 to 6 inches long which have a faint almond odour when crushed; the flowers are numerous in terminal panicles, and the ovoid berries about $\frac{1}{2}$ inch long. It has a fairly good, yellowish timber similar to English Beech.

PENTACERAS

(Referring to arrangement of carpels)

The genus is limited to a single species, endemic to Australia.

Pentaceras australis (Australian), growing 20 to 60 feet high in the scrub forests of the middle eastern coast from the Richmond River to Gympie, is a glabrous tree with alternate, pinnate leaves 6 to 12 inches long, pale underneath, and diminutive white flowers in a large panicle. It is called Bastard Crow's Ash, Scrub Hickory, Scrub White Cedar, or Moreton Bay Varnish Tree, according to various qualities claimed for it in different localities. The hardwood is pale-yellow, fairly close-grained, 54 lb. in weight, tough and durable, dresses and polishes well and is suitable for light furniture and panelling.

PERSEA

(Referring to name of an Egyptian tree)

A genus of one species in Australia.

Persea Baileyana (after F. M. Bailey): The Candlewood of Fraser's Island, Queensland, a scrub tree of about 60 feet, glabrous except the flowers, which are in racemes bearing distant, few-flowered clusters, the leaves ovate or ovate-lanceolate, opposite, 2 to 3 inches long, and green on both sides. The timber is dark-gray, close grained, and slightly fragrant.

PERSOONIA

(After C. H. Persoon)

The genus is a large one, there being sixty species, many of them small plants or shrubs, and, with the exception of one in New Zealand, is limited to Australia. The flowers in all species are yellow.

Persoonia arborea (a tree), growing to 30 feet in Victoria but scarce; this and some other species of the genus are known as "Geebung" from the succulent berries, which birds eat. The leaves are elliptical-lanceolate, with hairlets underneath, the flowers and fruit rather large. The wood is pale, hard and tough.

Persoonia lanceolata (lanceolate) is known as Bonewood on account of the whiteness and hardness of the small timber, which is specially useful for tool-handles. It occurs in Victoria, New South Wales and Queensland.

Persoonia linearis (linear): A small tree of 15 to 20 feet, common in sandstone country in Victoria, New South Wales and Queensland. The timber is of little value, 51 lb. in weight.

PETALOSTIGMA

(Stigmas petal-like)

The genus consists of a single species, endemic to Australia

Petalostigma quadriloculare (four - celled), known as Bitter-bark, Emu Apple, or Wild Quince, is a moderate-sized tree of the north coast of New South Wales and the coastal districts of Queensland, always occurring in groves. It has twisted, spreading branches (the branches and underside of the leaves silky), rough bark, small, ovate leaves that fall in the autumn, and the pretty, white, clustered flowers are followed very plentifully by orange-coloured, fluted berries as large as cherries and very bitter but are eaten by emus. The timber is hard, close-grained, brownish, with a fiddleback figure. The white sapwood is firm and about an inch in width. Dyes have been obtained from the bark, which is also used in a tonic mixture and the name "Quinine Tree" has consequently been given to it. It has a weight which corresponds to 48 lb. per cubic foot.

PHEBALIUM

(One of the ancient names of the Myrtle)

Besides the thirty-five Australian species which are all endemic, the genus comprises one in New Zealand.

Phebalium squameus (scaly), grows from 20 to 40 feet high, with leaves oblong-lanceolate or linear up to 3 inches and with yellow flowers in axillary corymbs. It grows in Victoria, Tasmania, New South Wales and Queensland, in moist forests, and is called Satinwood, and the timber resembles Red Cedar, being pale, hard and dense, weighs 45 lb., and is useful for cabinet-work and turnery.

PHOLIDIA

(Scaly)

The genus is limited to Australia.

Pholidia bignoniifolia (Bignonia-like flowers), known as Bignonia Emu-bush, and native to New South Wales, Queensland and South Australia, is a strongly-scented, small tree, quite glabrous and often glutinous, the leaves lanceolate or linear-lanceolate, acuminate, entire, contracted into a short petiole 2 to 6 inches long; purplish flowers; the fruit an ovate, succulent drupe $\frac{1}{2}$ inch long or more. The wood is yellowish-brown, close in grain, prettily marked, and fragrant; useful for cabinet-work, veneers and parquet flooring.

PIPTURUS

(Pepper-like seed)

The genus comprises but few species, dispersed over the Indian Archipelago and the Pacific Islands. There is only one Australian species.

Pipturus argenteus (silvery-leaved): A small tree, known as Australian Grass-cloth Plant, sometimes attaining 50 feet, found from Richmond River, New South Wales, to Cape York Peninsula, Queensland, also in the Pacific Islands. The ovate leaves on long stalks and the branches are hoary, the flowers grow in dense, globular clusters with very small bracts; the white, globular fruit is sweet and edible, and the wood is soft with gray or brownish bark.

PISONIA

(After M. Piso)

The species are numerous in tropical and sub-tropical America, and there are also a few in Southern Asia and in the Island region from the South African coast to the Pacific. Of the three Australian species one is widely spread over the tropical regions of the globe; another extends to Norfolk Island and New Zealand; the third is endemic. The genus consists of trees, shrubs, and woody climbers.

Pisonia Brunoniana (after Dr. R. Brown): This tree grows occasionally to about 60 feet with a diameter of 2 feet, in New South Wales and Queensland. It is known as Bird-catching Plant, Bird-lime Tree, Fly-catcher Tree, or Queensland Upas Tree, on account of the exceedingly sticky fruit, covered with a dark, viscid gum, causing them to adhere to birds, and sometimes the cause of their death. The ovate leaves mostly opposite, are often 8 inches long, and the fruit narrow and angular, 5 inches long. The wood is soft and light-coloured.

Pisonia inermis (thornless): A tree of 20 to 40 feet, occasionally taller, of Queensland, North Australia and the Pacific Islands, having greenish flowers and similar sticky fruit to the former species. The wood is of a light colour and soft. This species is closely allied to *Pisonia Brunoniana*.

PITHECOLOBIUM

(Monkey Pod)

A considerable tropical genus, distributed over the globe. Of the eight Australian species, one is also in the Indian Archipelago—the others are endemic.

Pithecolobium grandiflorum (large flowers), known as the Lace-flower Tree and Tortoiseshell-Tulip Wood, sometimes

as Marble Wood, growing to 30 or 50 feet, with a 9-inch diameter, on the coasts of northern New South Wales and Queensland, from the Hastings River to Cape York. It has large and fragrant, crimson-tipped flowers, rather like Honeysuckle in scent, and black, shiny seeds in long pods about 1 inch wide. The wood is light, soft, not durable, and the sapwood is liable to attack by borer insects, so the heartwood (which has a free and open grain and is easy to work) only is used for indoor decoration, fancy boxes, trays, etc., as it has a fine figure and colour (pink and yellow) which come out well when polished.

Pithecolobium Hendersonii (after J. A. Henderson):

This tree is found on the Logan River, Queensland, and from Richmond River, New South Wales, to Innisfail, North Queensland, and grows about 40 feet high, with glabrous leaves. The leaflets, often 3 inches long and $1\frac{1}{2}$ inches broad, are lanceolate, sessile and oblique at the base, especially the upper pair which are longer than the lower. The slender peduncles, sometimes forked, bear two heads, forming a sparsely-branched, terminal panicle, and the flowers in each head are ten to fourteen, the pod reddish inside, about 2 inches long and six to eight lines broad, and the oval, black seeds, about four lines long, placed transverse in the pod.

Pithecolobium Lovellae (after the Hon. Miss Lovell),

known as Baconwood, and found on Fraser's Island, is a small tree, 20 to 30 feet high, with a brown, smooth bark, and the young shoots clothed with dense, glossy, light-brown hairs, the leaves velvety pubescent. The panicle of sessile flowers are in irregular head-like clusters. This species in many respects resembles *Pithecolobium grandiflorum*, but differs from that species in the form of glands and foliage.

Pithecolobium moniliferum (pod like a necklace):

A tree known as "Mullar" and found on the islands of the Gulf of Carpentaria and along all its watercourses, has a rugged bark and wide-spreading, dense head; the young shoots are usually hairy. The leaflets, four to seven pairs, are obovate or oval-oblong, blunt at the base, the peduncles are clustered in the upper axis, forming a short terminal panicle, the numerous flowers in umbels, the pod sickle-shape 3 or 4 inches long, thick and hard, the seeds transverse, flat and thick. This species was originally described from Timor, and is found in several islands of the Indian Archipelago.

Pithecolobium pruinatum (frosted or powdered):

A small, ornamental tree growing from Shoalhaven, New South Wales, to Herberton, Queensland, and known as Snowwood, also Stinkwood, because of the odour of its freshly-cut timber. The young branches, foliage and flowers have a rusty hairiness. The

flowers are numerous in globular umbels, the pod several inches long, flat and curved, the seeds egg-shaped. The wood is of a light-yellow colour, becoming brown near the centre.

Pithecolobium Muellerianum (after Baron von Mueller) : A tree 50 to 70 feet high with a 2-foot diameter, known as Ash, growing in the vicinity of the Richmond and Brunswick Rivers, New South Wales. The wood is light-yellow, becoming brown near the centre and is of a very disagreeable scent when newly cut, is soft, and not durable.

PITTOSPORUM

(Resin-like substance in seed)

A large genus dispersed over the warmer regions of Africa, Asia the Pacific Islands and New Zealand. The Australian species are all endemic excepting one, which is common in eastern tropical Asia and the Eastern Archipelago. The genus has eleven species native to Australia and is distinguished by its very fragrant white flowers and citrus shaped leaves. Its clusters of berries are full of small, blackish seeds in a sticky substance, and the bark is aromatic.

Pittosporum bicolor (two colours) : This species is known as Tasmanian Boxwood, and popularly called by its aboriginal name of "Banyalla," and is widespread in south-eastern Australia, growing from 20 to 40 feet high. It is sometimes known as Whitewood or Cheesewood and its small, pale-yellow wood is very hard and uniform in texture, turns well, and is one of the best substitutes for Box; the aborigines used it for making clubs and it is suitable for axe-handles, billiard-cues and carving. The tree yields a good gum.

Pittosporum phillyraeoides (Phyllyrea-like) : A small, graceful tree of Victoria, New South Wales, Queensland, South and Western Australia, growing up to 30 feet, called Native Willow, and Weeping Pittosporum, on account of its foliage and habit, also Butter Bush; it is one of the so-called Quinine Trees and a useful fodder plant in the dry interior. The wood is pale, and very hard.

Pittosporum revolutum (petals rolled back), known as the Brisbane Laurel, growing in Queensland, New South Wales and Victoria, with leaves ovate-elliptical, shortly acuminate, 2 to 4 inches long, rusty underneath and flowers yellow, seeds numerous, red or brown. The wood is close-grained, and very hard.

Pittosporum rhombifolium (form of leaf) : Popularly known as White Holly, of New South Wales and Queensland, usually about 40 feet high but sometimes reaching 50 feet; the wood is white, close-grained with a delicate mignonette fragrance when freshly cut, useful for turnery, and possibly a substitute for English Boxwood in wood-engraving.

Pittosporum undulatum (wavy leaves) : A very handsome tree, commonly called Victorian Laurel or Sweet Pittosporum, also Mock Orange and growing usually 20 to 40 feet, exceptionally to 80 feet high, with wide branches close to the ground, the citrus-like leaves oval-oblong and glossy bright-green, 4 to 6 inches long; the small creamy-white flowers in thick, terminal, compound clusters, sweet-scented like orange-blossom; the round clustered berries, at first green and ripening to orange, are very decorative and split open when ripe to disclose numerous, dark-brown seeds in a sticky substance which also changes colour as the seeds ripen. This tree grows very profusely from seed and is common in Victoria, New South Wales, Queensland and Tasmania. It is strong, withstanding high winds, makes a handsome shrub for parks and gardens and is often used as a hedge as it stands heavy pruning and branches very low. Its gum is said to have healing qualities and its wood, which weighs 56 lb., is white or brownish-white, very close-grained and hard, and good for turnery. There is a variety of this species with variegated leaves, which is extensively cultivated in gardens.



Leaves and Fruit of
Pittosporum undulatum

PLEIOCOCCA

(Berries numerous)

The genus has only one species, which is indigenous to New South Wales and Queensland.

Pleiococca Wilcoxiana (after J. Wilcox) : This tree grows 50 feet high and is found to a limited extent from the Clarence River, New South Wales, to the Eungella River, Queensland. It has opposite leaves 4 to 6 inches long and about 2 inches broad, with visible midrib and veins, the small, white, globular fruit being fleshy and acid.

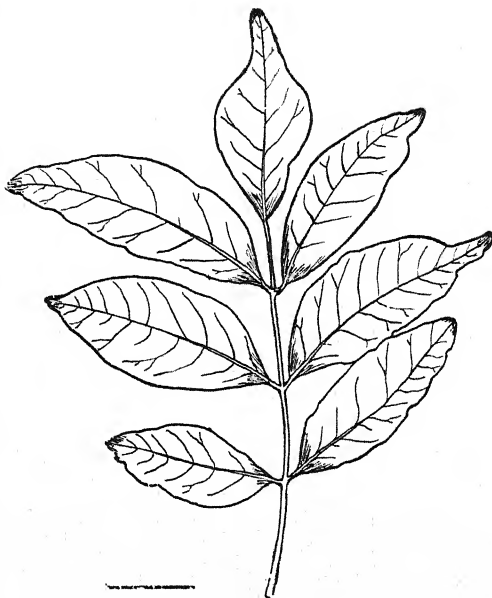
PLEIOGYNIUM

(Alluding to its many female parts)

A genus of one species, which is indigenous to Queensland and New Guinea.

Pleiogynium**Solandri**

(after Dr. D. C. Solander): A north-eastern Queensland tree, also found in Papua, 40 to 60 feet high and occasionally 80 feet, with yellowish-green, dense, clustered flowers in short, axillary racemes, and alternate, pinnate leaves of three to eleven lanceolate or ovate leaflets, 2 to 5 inches long, and brown, somewhat scaly bark. It is known as Hog Plum or Burdekin Plum on account of its rather fleshy, purple fruit. Its wood is hard, dark-brown with red marking (like American Walnut), close and straight-grained—a nice ornamental wood for joinery, turnery and cabinet-work.



Leaf of pleiogynium-Solandri

PODOPETALUM

(Petals stalked)

The genus is limited to a single species, endemic to Queensland.

Podopetalum Ormondi (after Hon. Francis Ormond): A tree with pinnate leaves, which are large and lanceolate, the flowers in panicle racemes, the wood pinkish-gray, strong, firm, but easy to work. It is found on the borders of rivers in tropical Queensland.

POLYALTHIA

(Much health)

A considerable genus, chiefly Asiatic, with one African species, one of the Queensland species extending to New Caledonia.

Polyalthia nitidissima (very bright) : A tree attaining 60 feet in height, glabrous in all parts, with shiny, alternate leaves 2 to 3 inches long, and globular fruit, which is reputed to have medicinal properties. It has wood of a dark-gray colour, close-grained, nicely marked, and with a strong spice-like fragrance when freshly cut. The aboriginal name for this tree is "Pankalville" and it occurs in New South Wales and Queensland.

POLYOSMA

(Very fragrant flowers)

The four Australian species are endemic. The genus comprises also several in East India, the Malayan Archipelago, and South Pacific Islands.

Polyosma Cunninghamii (after A. Cunningham), known as Cunningham's Laurel or Wineberry Tree of New South Wales and Queensland, from Wollongong to Gympie, is a tree of 40 to 60 feet in height, with a diameter from 1 to 3 feet; white or greenish, very fragrant flowers in short, terminal racemes 3 to 5 inches long, and opposite, lanceolate, toothed leaves 2 to 5 inches long by 1 inch broad, the black ovoid fruit $\frac{3}{4}$ inch long, prominently ribbed. It is sometimes called Featherwood, and the timber is soft, close-grained, yellow-coloured, nicely figured, its weight about 50 lb., tough and very hard, and is used for levers, ladders, hard spikes, etc.

POMADERRIS

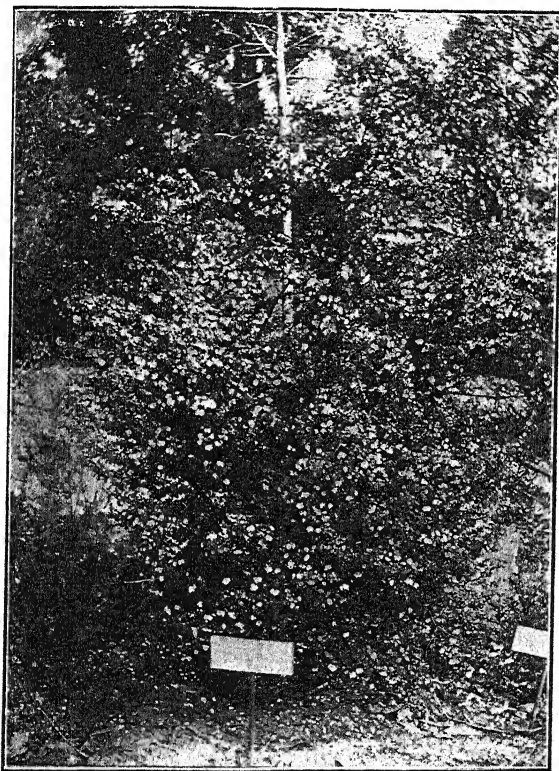
(Referring to the membrane over the seed-vessels)

The genus is confined to Australia and New Zealand. The Australian species are all endemic and in the eastern and southern districts—with the exception of two which are also found in New Zealand. The genus is represented by about twenty species of trees and shrubs.

Pomaderris apetala (no petal) : This species is sometimes a small tree growing to 35 feet in New South Wales, Victoria, South Australia, and Tasmania, also in New Zealand, and seen occasionally as an ornament shrub in gardens. Its flowers are small but very numerous, usually pale-buff, and its oval, hairy, pointed leaves are 2 to 4 inches long and generally flat. The wood is small but has a fine satin texture and can be used in cabinet-work, turnery, and for carving.

Pomaderris betulina (Birch-like) : A small tree occasionally reaching 25 feet in height and limited to Victoria and New South Wales. The leaves are rather small and the pale-yellow flowers short-stalked; the wood useful for walking-sticks, etc. It is worthy of garden cultivation as a foliage tree.

Pomaderris elliptica (elliptical): This tree, known to reach 50 feet in height, is found in Queensland, New South Wales, Victoria and Tasmania, also New Zealand. It has pale yellow flowers and the leaves are flat, large, and entire, usually whitish beneath, with a very close tomentum. It is confined to forest country.



W. R. Guilfoyle, photo.

Prostanthera rotundifolia

PROSTANTHERA

(Anthers spurred)

The genus is limited to Australia. The greater number of the species are extra-tropical, and there are over forty species, mainly growing in the south of Australia and often found in the high country. Numerous species are flowering shrubs of considerable beauty, popularly known as Mint Bushes and cultivated a good deal in gardens.

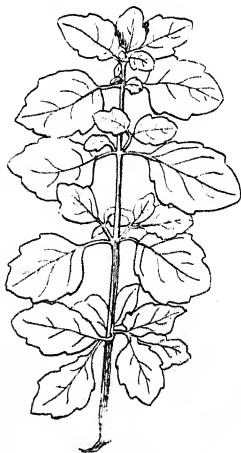


Prostanthera lasianthos

Prostanthera lasianthos (flowers woolly), growing to 20. or 30 feet high in all the States but Western Australia, is known as Australian Lilac (in Victoria it is called Christmas Bush because it flowers very abundantly at that season) also Dogwood, and the aboriginal name for it is "Coranderrk." It has rather small and thin, serrated, glabrous, dark-green oblong leaves, and masses of small hairy flowers, pinkish-white with purple spots. The tree yields an essential oil.

Prostanthera melissifolia (Balm-like), is known as Balm Mint Bush and is endemic to Victoria, a slender shrub, 12 to 15 feet high, with short hairs, and ovate leaves 1 to 2 inches long, the lilac flowers in leafless racemes. A handsome shrub for parks or gardens. It occurs on river-banks or in gullies.

Prostanthera rotundifolia (round leaves): A tall shrub 8 to 15 feet in height, greenish-yellow, limpid, and of a mint odour and taste, giving 12 oz. of oil from 100 lb. of leaves. The small timber is hard and tough, and the saplings make good fishing-rods. The colour of the flowers vary from lilac to purple. It usually occurs in sylvan habitats.



Prostanthera melissifolia

PSEUDOMORUS (False Mulberry)

The genus is limited to a single species in Australia, which extends to New Caledonia and Norfolk Island.

Pseudomorus Brunoniana (after Dr. R. Brown) is known as the Whalebone Tree. It is glabrous, growing to 50 feet with a 6 to 10-inch diameter, in the coastal districts of New South Wales and Queensland. It has a dense, symmetrical head of foliage, elliptical or ovate-lanceolate leaves up to 4 inches long, slightly hairy on the underside, flowers in solitary spikes, and sweet, white, globular berries about the size of a currant. The bark is gray or grayish-brown, and the timber moderately hard and tough, weighing 48 lb., with a close straight grain. It dresses well and is suitable for tool-handles, turnery, cabinet

and interior joinery work, and is used by the aborigines for boomerangs. Green parts of the tree and the bark exude a milky sap.

PSYCHOTRIA

(From *Psyche*, life)

A large genus, ranging over the tropical regions of the world. The eight Australian species are endemic and native to New South Wales and Queensland. The name of the genus alludes to the powerful medicinal properties of some of the species. The flowers are white.

Psychotria nematopoda (thread-like peduncles), known as Yellow Hickory, is a woolly brush tree, growing in the Mackay district of Queensland. It supplies a hard, close-grained, uniformly pale-yellow timber, 50 lb. in weight, with little sapwood, resembling English Box and used as a substitute for American Sycamore, planes well, and suitable for cabinet-work.

Psychotria nesophila (found on an island): A small, glabrous tree found on Albany Island, Queensland. Its leaves are broadly ovate or oblong, 1 to 3 inches long, the flowers in cymes, and the ribbed fruit globular and smooth.

PTYCHOSPERMA

(From *ptyche*, a fold or winding, and *sperma*, a seed)

The species of this genus of Palm are indigenous to Australia, Malay Archipelago, and New Guinea.

Ptychosperma elegans (elegant) is known as the Bangalow Palm and is indigenous to Queensland, a very ornamental, feathery-leaved palm 20 to 60 feet high, with a diameter of 12 inches, bearing a crown of from seven to nine leaves, about 3 feet long, the flowers numerous, sessile, solitary or in twos or threes. The leaves are used by the aborigines for water baskets. The stems are used for the rails of fences.

QUINTINIA

(After La Quintinei)

There are four species endemic to Australia, found in New South Wales and Queensland, and two species native to New Zealand.

Quintinia Fawkneri (after John Pascoe Fawkner): A tree about 60 feet in height with smooth whitish bark and yellowish wood. This tree is endemic to Queensland.

Quintinia Sieberi (after F. W. Sieber) : A tree common in the scrubs of the MacPherson Range, and Mount Mistake, Queensland, the Blue Mountains and the Tweed River, New South Wales, to the Victorian border. It is usually 30 to 40 feet high, but occasionally reaches 70 feet with a 24 to 30 inch diameter. Its oval, alternate, entire, leathery leaves are 3 to 4 inches long and the abundant white flowers are in racemes at the end of branchlets, the fruit a small three to five-celled capsule opening at the top, and the bark dark-brown, occasionally almost black, and corky. It is a curious but ornamental tree frequently found growing out of the *Dicksonia* tree-fern, from the stem of which it is propagated by seed, so blended as to appear to be one tree though on separate roots; it penetrates the trunk and eventually destroys it when its roots reach the ground; but the tree sometimes grows alone. The timber is heavy, close-grained, of a yellowish shade, and of good quality.

Quintinia Verdonii (after Sir George Verdon) : A small tree found at high altitudes, from Manning River to Maroochy River, Queensland. It would be suitable for a garden, as it has long spikes of profuse pale-yellow flowers.

RANDIA

(After Isaac Rand)

A considerable genus dispersed over the tropical regions of the globe. There are eight Australian species of trees or shrubs.

Randia densiflora (crowded flowers), growing on the coasts of New South Wales and Queensland, is 20 to 30 feet high with a diameter up to 12 inches, the leaves oblong or lanceolate, 4 or 5 inches long, the white flowers crowded in dense cymes, the fruit a small, globular berry; the timber (54 lb. weight per cubic foot) resembles English Box in colour and texture, is of a light colour, close-grained, hard and tough.

Randia Fitzalani (after E. Fitzalan) : A glabrous tree 30 to 50 feet high, with obovate-oblong, smooth, shining leaves 6 inches long, and white flowers in loose cymes, with globular fruit about $\frac{1}{2}$ inch in diameter. It occurs in the tropical scrubs of Queensland and has straw-coloured, close-grained, tough and hard timber, which might prove suitable for wood stamps.

RATONIA

(From *Raton*, a species in St. Domingo)

A large tropical genus, especially numerous in America. The fourteen Australian species are all endemic.

Ratonia anodonta (toothless): This species is native to the north of New South Wales and the Queensland coasts, growing in Queensland to Proserpine, up to 75 feet high with a diameter from 20 to 30 inches. It has ovate-lanceolate leaves 2 to 4 inches long, very small flowers single or in small cymes, and a pear-shaped seed-capsule, also a valuable wood of moderate weight (60 lb.), light-brown, close-grained, hard and tough, and dressing well, but has no remarkable figure.

Ratonia pyriformis (pear-shaped): A tree popularly known as Brush Apple and growing from the Bellinger River, New South Wales, to Atherton, Queensland, 30 to 40 feet high. The pleasing, very light-brown wood is firm and tough but free-working, has a wavy figure, polishes well, and is suitable for coach-building, axe handles, etc.

Ratonia stipitata (having a stripe): A moderate-sized tree 40 feet high, growing in the Macleay and Clarence Rivers districts of New South Wales to the Queensland border, also in Fraser's Island. It has four to six leaflets to each leaf, 2 to 5 inches long and 2 inches wide, and the timber weighs 58 lb. per cubic foot, the sapwood furrowed, the heartwood light-brown, close-grained, inter-locked, and suitable for veneers, ornamental cabinet-work, furniture, coach-building, etc.

Ratonia tenax (rough-leaved): A moderate-sized tree of New South Wales and Queensland called Brush Teak, and having a light-coloured wood, darker in the centre, tough and close-grained, 46 lb. weight, polishing well and suitable for coach-building.

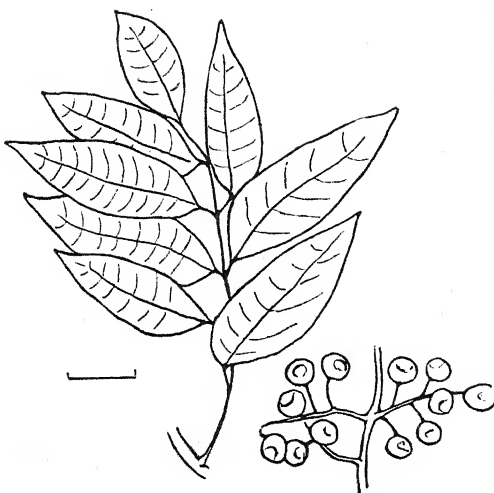
Ratonia distylis (two styles) is a tree of considerable size, with smooth bark, the leaflets two or sometimes one at the end of a short common petiole, from obovate-oblong to elliptical, obtuse, 2 to 3 inches long. The small panicles have minute, appressed hairs, the seed-capsules flattish and two-celled, about $\frac{1}{4}$ inch broad, the valves coriaceous. It is found from the Brisbane River and Bunya Mountains, Queensland, in the south, to Port Denison in the north. The wood is close in grain, hard, and tough.

RHODOSPHAERA

(Red fruit)

A genus of two species in Australia.

Rhodospaera rhodanthema (red-flowered): An ornamental tree growing in the central, east coastal scrub forests of



Rhodospaera rhodanthema
(Leaf and Fruit)

New South Wales and Queensland (from the Clarence River to Maryborough) and extending inland to the Bunya Mountains. It is known as Yellow Cedar and reaches from 50 to 100 feet in height, with a smooth flaky, brownish bark, pinnate leaves with three to five pairs of leaflets, large red flowers in dense clusters, and small brown globose fruit. The timber is bright-yellow, hard, 47 lb. weight, close-grained, has a wavy figure, dresses

and polishes well, useful in various trades for cabinet-work, panelling and parquetry.

Rhodospaera rufa (red): A small tree found about Rockingham Bay, Queensland, with a smooth bark and milky sap, slightly-haired branches, broad and flat oblong-lanceolate or ovate entire leaves, opaque underneath, 3 to 5 inches long, and small round black fruit.

SANTALUM

(From the Persian name of one species)

Besides the Australian species, which are endemic, there are a few nearly allied species in East India, the Eastern Archipelago, and the north and south Pacific Islands. The Australian Sandalwoods are small trees or bushes of straggling habit, seldom more than 12 to 25 feet in height, with boles from 8 to 10 feet high (maximum-sized boles about 18 inches in diameter) and occasionally the bole has attained to 25 feet in height. They are becoming scarce but are still found beyond the Darling Range and on the coast of Sharks' Bay, Western Australia, and North and South Australia, growing as a parasite on the roots of other trees, such as *Acacia* (the Raspberry-Jam Tree especially), *Eremophila*, *Casuarina* and many other genera. They are less fragrant than the Indian Sandalwoods, but have a good medicinal oil, chiefly in the root hardwood. From the early years of settlement the timber has been exported from Western Australia (where it used to be common throughout the central and south-western districts) to China and neigh-

bouring countries, for crushing and making into small sticks which are burnt as incense in Chinese religious rites. The light-yellow wood is also used for carving decorative, small boxes, beads, etc.

Santalum lanceolatum (narrow): This species is found in the north-west of Australia, growing 15 to 25 feet high, with a slender, erect stem, lanceolate leaves 1 to 2 inches long, and small, purple, globular drupes. The wood is firm, yellowish in colour, close-grained, and useful for cabinet-work.

SCHIZOMERIA

(Jagged petals)

The genus is limited to a single species, endemic in Australia.

Schizomeria ovata (ovate leaves): This tree grows to 50 or 60 feet high with a 1 to 2-foot diameter, and occasionally in New South Wales to 100 feet with a 4-foot diameter. It is found from Illawarra, New South Wales, to the Eungella Range, Queensland, and called White Cherry, Crab Apple, Coachwood, Corkwood or Black Beech. It has opposite, ovate, toothed leaves 3 to 6 inches long but narrow, with distinct veins, small, whitish flowers, and small, white, egg-shaped berries. The bark at first is smooth, late it becomes rough and corky. The timber has a reddish tint, is fairly soft and open-grained, not durable outdoors but suitable for packing-cases.

SCOLOPIA

(Thorny species)

The genus is dispersed over South and East Africa and tropical Asia. The one Australian species is endemic.

Scolopia Brownii (after Robt. Brown), known as Gunstock Wood and Mountain Cherry, grows to 30 or 40 feet usually, but has reached about 80 feet in a few known specimens. Its habitat is the scrub forests on the east coast north of the Illawarra district, New South Wales, to Cape York Peninsula, Queensland. The leaves are ovate-lanceolate up to 3 inches long sometimes arined with thorns in the forks and the small, white flowers have many stamens; the small berries are globular and the bark smooth and thin. The timber is considered one of the best of the scrub trees, chocolate in colour, darker in the centre, tough, hard and close-grained, with little sapwood and an inconspicuous figure. It resembles English Walnut, for which it is a good substitute though rather coarse in texture, weighs 60 lb. per cubic foot, suitable for tool handles, gunstocks, etc., and heavy carriage frames. It is of dense and symmetrical growth and very ornamental.

SEMECARPUS

(Marking nut)

The genus ranges over tropical Asia, the species most numerous in Ceylon.

Semecarpus australiensis (Australian), growing about 50 feet high, is called Marsh Nut or Marking-fruit Tree in Queensland and North Australia, its range being the coastal districts of Queensland to Torres Straits; it also occurs in India and Asia, where it is known as the Kidney Bean of Malacca, consequently it is not strictly an Australian native tree, though growing here naturally. In India the oil and juices of the fruit are used medicinally and for other purposes, including printing and marking linen and as a black varnish. It is a spreading-headed tree with thick branches, gray bark, leaves broadly obovate, 3 to 4 inches long and hoary underneath, greenish-yellow flowers, and small pale velvety fruit about 1 inch in diameter, which is thick and fleshy and when ripe is eaten by the aborigines, being best roasted, when it tastes like baked apples and when dried like dates. The wood is yellow with brown markings.

SESBANIA

(An Arabic name)

The genus is widely spread over the tropical regions of the world. There are five species in Australia, all shrubs but one, which is a small tree.

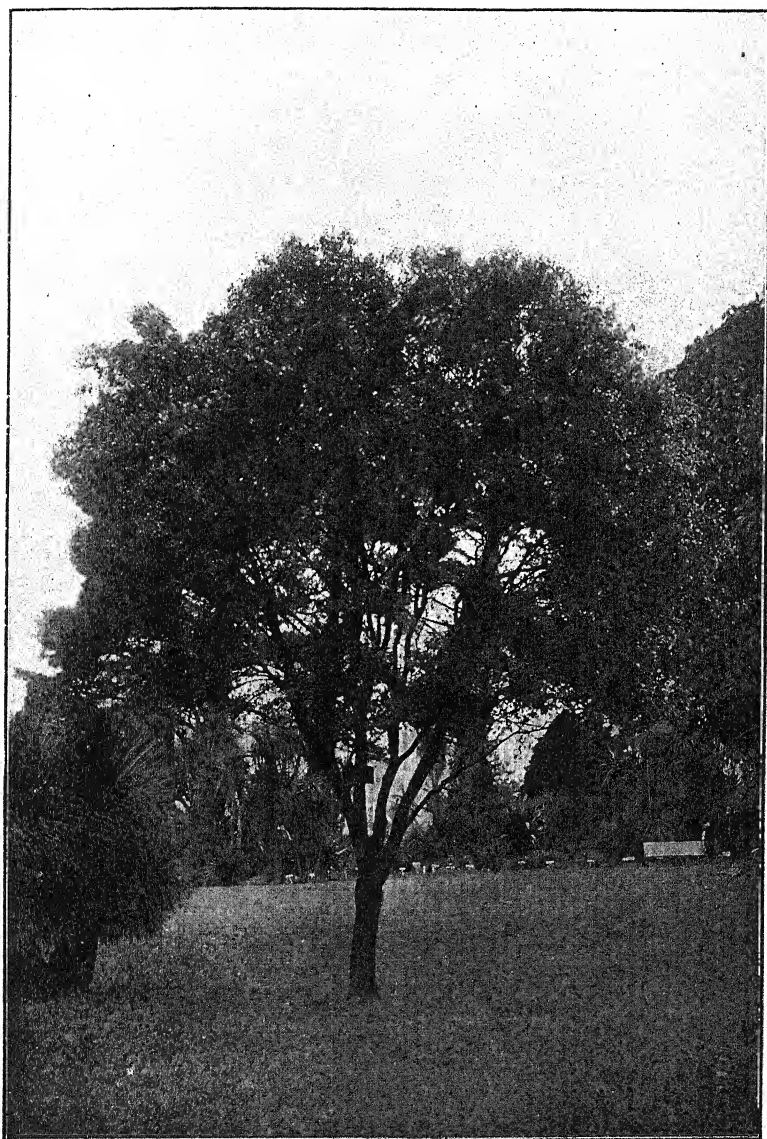
Sesbania grandiflora (large-flowered), known as the White-flowered Pea-tree, grows to 26 feet in Queensland and north-west and South Australia, also in Malaysia. It has large white flowers in short racemes of two to four leaves, the petals 2 to 3 inches long, oblong pinnate leaves and leaflets in ten to thirty pairs, seed-pods over 1 foot long, and a light corky bark and soft wood.

SIDEROXYLON

(Ironwood)

Twelve species of this genus occur in Australia, mostly small trees or shrubs of the eastern part of Australia, especially New South Wales and Queensland.

Sideroxylon Brownlessianum (after Dr. A. C. Brownless): A tree about 40 feet high, the young growth silky with thin coriaceous leaves 2 to 4 inches long, and 8 to 12 inches broad, hoary on the underside on short petioles. The wood is hard, close-grained and useful for engraving purposes.

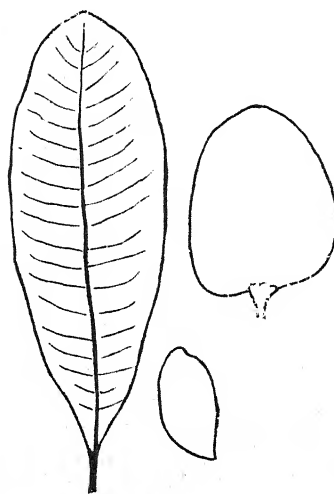


W. R. Guilfoyle, photo.

Scolopia Brownii (Gunstock Wood)

Sideroxylon australe (Australian): A large tree growing to 100 feet with a 2 to 3-feet diameter and a weight of about

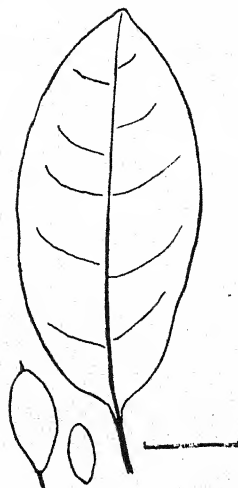
66 lb. per cubic foot, glabrous except the young shoots, and known as Queensland Hardwood and Scrub Crab-Apple, the latter name on account of its large, dark-purple fruit, 2 inches in diameter, but insipid in flavour. It has obtuse, acuminate and broadly obovate-oblong leaves 3 to 4 inches long, thick, shiny, and prominently veined, and grayish-white flowers in clusters of two to six. The wood requires very careful seasoning but is one of the finest hardwoods in Australia, close-grained and straight, firm, very hard, tough to work, nicely marked, pale-yellow in colour with darker markings, the interwoven grain giving it a very attractive appearance. It is used for cabinet-work, turnery, staves



Sideroxylon australe
(Leaf, Fruit and Seed)

and laths, machine-bearings, and heavy carriage-frames, general building purposes, parquetry, carving, etc.

Sideroxylon Richardi (surname Richard): This tree is called Sycamore in southern New South Wales and also grows in Queensland, 80 to 150 feet high with a 2 to 4-feet diameter. It has ovate-oblong leaves 3 to 5 inches long and a wood light-gray in the sapwood and brown in the centre with a close grain.



Sideroxylon Richardi

Sideroxylon myrsinoides (Myrsine-like): This slender tree grows 20 to 30 feet high and 12 to 18 inches in diameter, in northern New South Wales to Bundaberg, Queensland, with leaves shortly stalked and prominently veined, 1 to 3 inches long, and flowers in axillary clusters. Its wood is firm, elastic, and hard, easily worked, and useful for shafts, timber-trucks, etc.



Stenocarpus sinuatus
(The Firewheel Tree)

Sideroxylon euphlebiun (prominent veins) is a medium-sized tree native to Queensland. The leaves are 2 to 3 inches long, lanceolate-ovate, with reticulate veins dense and prominent, the flowers in axillary clusters; the fruit sessile eight to sixteen lines long, almost globose; the red seeds one to four and eight to twelve lines long. The wood is yellow, hard and close-grained, and useful for general building purposes.

Sideroxylon chartaceum (papery): A tall tree native to Queensland, and known by its aboriginal name of "Moiary," with thin leaves, ovate-oblong, or elliptical, the fruit nearly globular, not succulent. The timber is firm, elastic, hard but easily worked, used for dray-poles, shafts, timber trucks, etc.

Sideroxylon Pohlmanianum (after R. W. Pohlman): An erect tree called Jungle Plum or Yellow Box of Queensland, growing 40 to 70 feet high with a 21-inch diameter, from the Tweed River, New South Wales, to Atherton, North Queensland. It has gray and scaly bark, silky-hairy branchlets, alternate leaves crowded at the end of branches, obovate - oblong, obtuse or rounded at the apex, 3 to 5 inches long, flowers in groups, and globular fruit about 1 inch in diameter. The wood is yellow, hard, close-grained, weighing 40 to 70 lb. and suitable for indoor fittings and cabinet-work. It is the best Queensland species for engraving-wood.



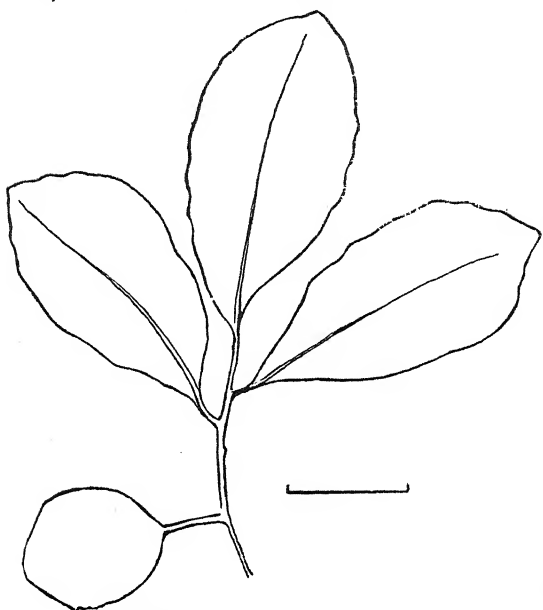
Sideroxylon Pohlmanianum
(Leaves and Fruit)

SIPHONODON

(Teeth united into a tube)

Besides the three Australian species which are endemic, it comprises only one in the Indian Archipelago.

Siphonodon australe (Australian): This species is called Ivory Wood on account of its creamy-white, glossy-grained



Siphonodon australe (Leaves and Fruit)

wood, and sometimes Native Guava. It is found in the coastal scrubs of northern New South Wales and southern Queensland, from the Clarence River to the Bundaberg district, usually a slender tree, 40 to 50 feet high and occasionally higher. It has obovate-alternate rather glossy leaves, pale underneath, 1 to 3 inches long and broad at the apex, the few, lemon-coloured, sweet-

scented flowers about $\frac{1}{4}$ inch in diameter in small cymes, and the fruit a bright yellow, hard, and pear-shaped nut of 1 to 2 inches diameter, the brownish-gray bark usually furrowed. The timber is pale-coloured, very close-grained, firm, easily worked, 48 lb. weight, with no sapwood, and very good for cabinet-work and indoor fittings.

SLOANEA

(After Sir Hans Sloane)

A genus of four species endemic to Australia.



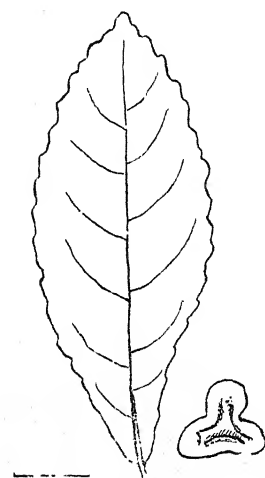
Sloanea Woollsii
(Fruit-capsule)

Sloanea Woollsii (after Dr. W. Woolls), known as "Carrabeen" or "Yellow Caribeen," is a large tree growing up to 140 feet high, common in the brush-forests of the northern rivers of New South Wales and on the Macpherson and Killarney Ranges, Tambourine Mountain, Mount Mistake, and the north coast of Queensland, as far as Gympie. The buttresses sometimes extend 12 or 14 feet up the stem, the edges curving outwards, and the

brownish-gray bark is flat and warty. The young shoots and flowers are finely downy, the alternate leaves elliptical, coming to a point at the apex, with distinct net veins on both sides, 3 to 5 inches long and about half in width, the white flowers about $\frac{1}{2}$ inch diameter in narrow racemes, the fruit a capsule about $\frac{3}{4}$ inch long covered with rigid, sharp bristles. The moderately light timber is used for indoor fittings and cabinet-work.

Sloanea australis (Australian), known as Hedgehog Fruit from its bristly seed-capsules, and Maiden's Blush Tree because

of the transitory, pink tint of its freshly-cut timber, and sometimes called by the aboriginal name of "Cudgerie." It is a medium-sized to large tree growing up to 100 or even 130 feet, common in the northern coastal brush forests of New South Wales and southern Queensland, with flat but scaly brown bark, alternate obovate or elliptical leaves up to 10 inches or 1 foot long, paler on the underside, and with serrated margins, the creamy flowers downy, about 1 inch in diameter, single or in racemes, the fruit a thick woody capsule with rather soft bristles, opening in four valves about $\frac{1}{2}$ inch long, the seeds black and shiny. The timber has a transitory pinkness changing to a light-brown colour, and is light, close-grained, relatively soft, but durable, easy to work,



Sloanea australis

has a nice figure and suitable for indoor work and, owing to its lightness, also for motor-car work, planking of small boats, etc. The tree is buttressed at the base.

STENOCARPUS

(Narrow fruit)

The genus extends to New Caledonia, the three Australian species are endemic.

Stenocarpus Cunninghamii is a small glabrous tree with leaves oblong-lanceolate, about 2 to 4 inches long, tapering into a short petiole. The flowers are very similar to those of *Stenocarpus salignus*, except that the ovary appears to be quite glabrous. It is worthy of cultivation in parks and gardens.

Stenocarpus salignus (Willow-like): A glabrous tree with spreading head, ovate-lanceolate leaves 2 to 5 inches long,



Stenocarpus salignus

narrowed at each end, and white or greenish-white flowers about 1 inch in diameter, twenty or more in a fanlike cluster at the end of a slender stalk, the fruit a 2 to 4 inch follicle, and the bark brown and slightly wrinkled. It grows on the Illawarra coast of New South Wales and into Queensland to the Macpherson Range, from 20 to 25 feet high and sometimes attains 80 feet — the only *Proteaceous* tree common in Cedar forests. It is called Red Silky Oak and New South Wales Beefwood, and has fissile timber of a very deep-red colour, fairly hard, close-

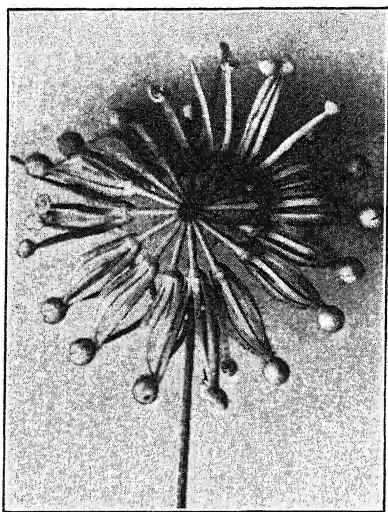
grained, 51 lb. in weight, with a good figure and very suitable for furniture, cabinet-work, veneers, walking-sticks and turnery, also for heavy work. It is a decorative tree, especially in shrub size, though the small flowers are not nearly so showy as those of *Stenocarpus sinuatus*. It weighs 44 lb. per cubic foot.

Stenocarpus sinuatus (lobe-leaved): An especially interesting species on account of its wonderful flowers. It is appropriately known as Fire-wheel Tree and sometimes as Chandelier-Flower Tree, having bright-scarlet flowers about 4 inches in diameter, with orange round the centre and tips, shaped like a wheel with thin spokes, very brilliant and unique. It grows from 30 to 100 feet in height and is native to the brush forests of northern New South Wales and southern Queensland, and not very plentiful in its native habitat, but is cultivated successfully in other States and occasionally seen in private gardens. The leaves are deeply lobed, firm in texture, bright-green, and 12 inches long, the fruit a boat-shaped follicle 2 to 4 inches long with numerous thin and flat seeds. The timber is close-grained, hard and durable, nicely figured, and excellent for indoor decoration and furniture. (See page 274.)



W. R. Guilfoyle, photo.

Stenocarpus sinuatus (Firewheel Tree)



"Herald" Features Service, photo.

Flower of Firewheel Tree

Stenocarpus sinuatus

STRYCHNOS

(An ancient plant)

The genus is dispersed over the tropical regions of the world. The four Australian species are endemic. Known as Strychnine Tree.

Strychnos arborea (tree):

A tree growing to 60 feet high with a 12-inch diameter, on the coast of Queensland from Brisbane to Rockhampton. It has broadly ovate leaves, bluntly pointed, smooth and shiny, about 2 inches long, small flowers and globular berries. Its timber is hard, close-grained, pale yellow with white streaks, and weighs 62 lb. to the cubic foot.

Strychnos lucida (glossy leaves) is a small tree with dark-gray wood, which is very tough and elastic and useful as hoops for casks. It grows on the Islands of the Gulf of Carpentaria and Thursday Island.

SYMPLOCOS

(Stamens united)

The genus ranges over tropical and sub-tropical Asia and America. Of the three Australian species, one extends to the South Pacific.

Symplocos spicata (flowers in spikes): A moderate-sized tree that occasionally reaches 100 feet high, quite glabrous, growing from the Richmond River, New South Wales, to Atherton Tableland, Queensland, also Lord Howe Island, Fiji, and the East Indies. The leaves are about 4 inches long, varying from obovate to lanceolate, smooth, shiny and almost rigid, the numerous, small flowers in spikes, the small fruit ovate. The bark is brown and scaly, the timber hard, 44 lb. in weight, close and straight-grained, easy to work, pale-yellow, and suitable for panelling, carriage and cabinet-work.

Symplocos Thwaitesii (after G. H. K. Thwaites): A large tree with firm and shiny leaves and large flowers in simple or branched racemes. It is widely spread over East India and the India Archipelago. The wood is light-coloured, fine-grained and tough. It is indigenous to New South Wales and Queensland.

SYNOUM

(Ovules united)

The genus of two species is endemic to Australia.

Synoum glandulosum (having glands), known as Dogwood, Spurious or Scentless Rosewood, Red Sycamore, or Brush Bloodwood, grows from 30 to 60 feet high in the coastal brush forests from Milton, New South Wales, to Bundaberg, Queensland. It has alternate pinnate leaves of seven to eleven leaflets, 3 to 4 inches long, and small flowers in short, dense panicles, fleshy fruit, with bright red seeds. The timber is dark-brown and generally very scaly, deep-red in colour when fresh and scented faintly, firm, easily worked, polishes well, and has a pretty sheen, and is much favoured for cabinet-work.

TARRIETIA

(Javanese name)

Besides the three Australian species, which are endemic, there is another in the Indian Archipelago.

Tarrietia actinophylla (radiating leaves), known as Ray Tree or Black Jack, called also Tulip Oak and Rayed Stave-wood, is a tall tree, growing numerously in the mountain scrubs south of Brisbane, Queensland, and reaching to 140 feet with a diameter of 3 feet, the trunk prominently buttressed, the bark dark-brown or almost black and finely fissured. The bell-shaped flowers are in long panicles and the alternate leaves of three to nine leaflets radiating umbrella-like from the top of the stalk, the fruit about 1 inch long; the timber is very tough, 60 lb. in weight, straight-grained with conspicuous rays, suitable for chair-making, carriage-work, axe-handles, staves, etc., but subject to the borer insects.



Tarrietia argyrodendron

Tarrietia argyrodendron (leaves silvery beneath), an Ironwood, called Crow's Foot Elm, Stavewood and Brown Oak, sometimes Silky Elm and Queensland Silver Tree, a native of the scrubs of the north coast of New South Wales and Queensland, from Manning

River, New South Wales, to Endeavour River, Queensland, but most plentiful in the latter State, and growing 60 to 80 feet and sometimes to 100 feet in height with a 4-foot diameter. The leaves, which are compound, consist of three leaflets at the end of the stalk, and are covered beneath with small silvery scales, and the timber, which is well known in the east of Australia, is light-coloured and ornamental, of medium weight, tough, firm, with rather open straight grain, dresses and polishes well, and when carefully seasoned it is valued as cooper's wood and is useful for interior panelling, furniture, brush-backs and ornamental boxes. It has been tested successfully for pulping for paper-making.

Tarrietia trifoliata (three-leaved), the Red Beech of the Johnstone River, Queensland, with timber resembling Red Cedar, but harder, not durable when exposed but useful for indoor work.

TELOPEA

(Seen at a distance)

A genus of three species endemic to Australia in the south-east.

Telopea oreades (of the mountains), the Victorian or Gippsland Waratah, and found also on the south coast of New South Wales, grows to 30 or 40 feet high with a diameter up to 18 inches. The leaves are lanceolate, about 8 inches long, narrow towards the base, and the rich crimson, unusually-shaped flowers are crowded on a head-like raceme, the stalked fruit 2 to 3 inches long. The bark is very thin and smooth, dark-brown in colour, the timber light-brown, fairly hard, elastic, 45 lb. in weight, with a particularly attractive grain, and is one of the most beautiful of Australian timbers, works and polishes well, useful for veneers in decorative work and suitable for pick-handles. The young suckers are used for basket making.

Telopea truncata (shortened), the Tasmanian Waratah, is a small tree not exceeding 20 feet in height, growing chiefly on the mountains of that State. It has red flowers like those of the Victorian Waratah but larger, and resembles that species except that its leaves are slightly shorter and its timber is similar but with darker heartwood, very suitable for small cabinet-work and veneers, but requires most careful seasoning.

Telopea speciosissima (very beautiful) is the well-known Waratah of New South Wales, one of the most decorative of Australian plants, with handsome lobed foliage and magnificent, large, rich-crimson flowers which are generally accepted as the national flower or floral emblem of that State. The timber is too small for use, but its shoots are sometimes employed.

TERMINALIA

(Leaves usually at ends of branches)

The genus is distributed over the tropical regions of the globe, a very few species extending beyond the tropics of South Africa or in North India. The twenty Australian species are endemic except two.

Terminalia oblongata (oblong leaves): A small tree with spreading branches, the leaves cuneate-oblong, very obtuse or emarginate, 1 to 3 inches long, thin and reticulate, the fruit two-winged, $\frac{3}{4}$ inch long and twice as broad. The wood is light-coloured and nicely marked, suitable for cabinet-work. This tree is endemic to Queensland.

Terminalia Catappa (its Molucca name), known as Country Almond, is a tree of about 80 feet, the branches in horizontal whorls, the leaves alternate, clustered at the ends of the branches on short petioles, obovate from a cordate but very narrow base, 6 to 8 inches long, the flowers white, and the fruit yellow, 1 to 2 inches long, with fleshy epicarp. The wood is red with a light-coloured sapwood. It occurs in Queensland.

TIEGHEMOPANAX

(After van Tieghem)

The genus is widely distributed over the tropical regions of the Eastern Hemisphere and extends to New Zealand. The seven Australian species are endemic and belong to the Eastern States and two occur in Tasmania. (Synonym: *Panax*.)

Tieghemopanax elegans (handsome), known as Laurel Light or White Sycamore, Celery Wood, Black Pencil Cedar, Silver Bass Wood, and Slender Umbrella Tree. A graceful tree, generally palm-like in appearance, with a clean trunk and an umbrella-like collection of handsome foliage. It grows 40 to 80 feet high with a diameter of 2 feet in the coastal scrubs from Illawarra, New South Wales, to Cairns, Queensland, with large and compound, alternate, pinnate leaves consisting of egg-shaped leaflets, 2 to 5 inches long, somewhat hairy flowers in much-branched racemes, numerous flattened circular fruits about $\frac{1}{4}$ inch wide, and fissured gray bark which has a faint celery scent when fresh. The timber is light and soft, not durable, liable to warp and crack, but has a pretty grain.

Tieghemopanax Macgillivraei (after J. MacGillivray): A small glabrous tree with pinnate leaves, 6 to 10 inches long and very flat fruit, growing at Cape York and Albany Island, Queensland. It has wood of a light colour, tough, and useful for axe-handles, etc., and would make good lining-boards.

Tieghemopanax Murrayi (after P. Murray): Known as Pencil Wood and Umbrella Tree, this species is a fine tree growing to 60 feet high in Victoria, New South Wales and Queensland, with very long, pinnate leaves consisting of nine to thirty leaflets or more, up to 10 inches long. Its very light wood (the lightest in Victoria) is suitable for pencils and penholders, and has been used for axe-handles.

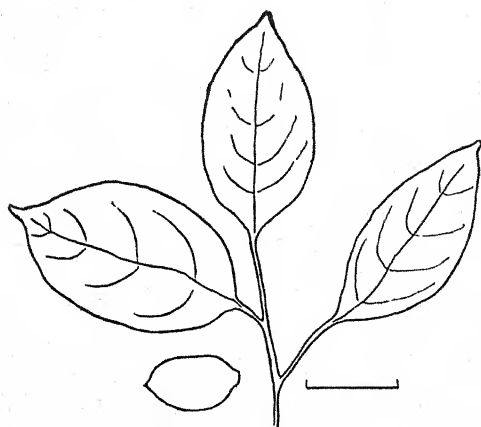
Tieghemopanax sambucifolius (Elder-leaved): A very handsome, small, glossy tree growing to 20 feet high, known as the Australian Elderberry Bush and found chiefly in the undergrowth of deep forest glades and rich mountain slopes of New South Wales, Victoria and Tasmania, and known as Mountain Ash in Victoria. The small flowers are greenish, and the pinnate leaves are rather fine in texture and variously lobed. It makes a nice shrub in gardens, especially when quite young, its foliage and berries being attractive. The wood is prettily streaked, sound, very tough and extensively used for axe-handles, etc., by splitters in the bush.

VILLARESIA

(After M. Villarez)

A genus of two species in Australia.

Villaresia Moorei (after C. Moore), known as Silky Beech, New South Wales Maple, Soapwood and Churnwood—



Villaresia Moorei

a tall, handsome tree of the eastern brush forests from Bulli, New South Wales, to the Bunya Mountains, Queensland, attaining 120 feet in height with a 5-foot diameter. The bark is thin, yellowish, furrowed and corky, the young shoots and flowers hairy, the alternate leaves varying in shape and up to 6 inches long by 2 or 3 inches broad, and the small yellow

flowers are in panicles, the fruit a small, black, oval or globular, succulent berry about 1 inch long. The timber is rather light in colour with prominent rays, like the English Beech in figure, texture and hardness, rather light in weight, and suitable for panelling, bedroom suites, boxes, etc.

Villaresia Smythii (after R. B. Smyth): A small tree native to Queensland, with ovate-acuminate leaves thinly reticulated, 3 to 5 inches long and 1 to 2 inches broad. The timber is close-grained, and prettily marked. It is known as Scrub Silky Oak.

VITEX

(A name used by Pliny)

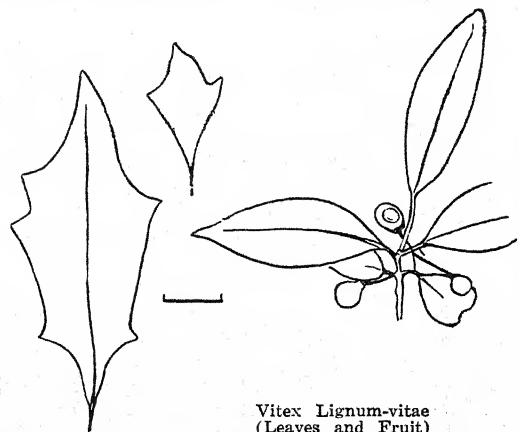
A considerable tropical and sub-tropical genus, chiefly Asiatic or African, with a few American species, and one species extending to southern Europe. Of the four Australian species, one is widely spread over the Eastern Hemisphere within the tropics, another extends to India and China, and the other two are endemic.

Vitex acuminata (acuminate leaves): This species occurs in Queensland and North Australia, larger in the north than in southern Queensland; the young shoots are hoary, the ovate-oblong leaves of three to five leaflets are 2 or 3 inches long, the flowers mostly in terminal panicles of 2 to 4 inches, and the fruit a small red, globular, succulent berry. Wood brown, close-grained, suitable for cabinet-work.

Vitex glabrata (glabrous): A small tree of Cape York Peninsula and the Gilbert River. This species extends to India and Cochin China and has small, white flowers in loose, forked cymes and four-celled black fruit. The timber is useful for cabinet-work.

Vitex Lignum-vitae (timber called Lignum-vitae) occurs on the north coast of New South Wales and the south coast of

Queensland, and is so called because the timber resembles the American Lignum-vitae, and also called Black Satinwood. It is a handsome scrub tree growing from Port Curtis northward and inland to the Bunya Mountains, Queensland, from 60 to 80 feet high and occasionally up to 120 feet with a 3-foot diameter, with



Vitex Lignum-vitae
(Leaves and Fruit)

rose-coloured flowers and various-shaped leaves. The inner bark is yellowish, the timber fine-grained, hard and strong, 56 lb. in weight, dark-pink with fine rays, planes and dresses

well and should be useful for indoor fittings; it is durable and can be used for fencing-posts.

WEINMANNIA

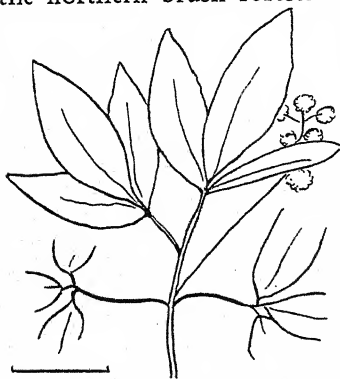
(After J. W. Weinmann)

A genus widely distributed over the warmer regions of the globe, extending into extra-tropical South America, South Africa and New Zealand. Five species are indigenous to Australia. (Synonym: *Geissois*.)

Weinmannia Benthamii (after George Bentham), known as Red Carrabeen, and Tile Seed, is a Leather-jacket, 50 to 60 feet high, sometimes attaining about 100 feet with a 3-feet diameter. The stem is buttressed at the base, the bark gray, the timber firm and easily worked, good for indoor work. It is native to New South Wales and Queensland.

Weinmannia Biagiana (after G. Biagi): A tree 60 to 70 feet high, with smooth bark. The leaves are 6 to 12 inches long and 3 to 6 inches broad with prominent midribs, lanceolate-ovate, distinctly toothed, and flowers yellow in panicles, 3 to 5 inches long, and with sixteen to twenty stamens. The wood is close-grained and useful for planes, mallets and chisel-handles. It is endemic to Queensland.

Weinmannia lachnocarpa (hairy capsules): A tall tree of the northern brush forests of New South Wales and southern districts of Queensland, growing to 130 feet with a 3-foot diameter, the stem often buttressed. The leaves are opposite, of three slightly serrated leaflets 2 to 4 inches long, the small flowers without petals in slender racemes, the fruit a hairy capsule $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter. The bark is yellowish or light-gray, the timber one of the best of our hardwoods and good for cabinet and general indoor work, machinery bearings, mallets, golf-clubs, etc., being very hard but easily worked, exceptionally even-



Weinmannia lachnocarpa

textured, 50 lb. in weight, close-grained, with very little sapwood, and pink in colour (red when freshly cut), popularly known as Marara, Scrub Redwood or Red Carrabeen.

Weinmannia rubifolia (red-leaved) is known as Marara Tree and grows on the Hunter River, New South Wales, to the Queensland border, 20 feet in height, with white flowers, and leaflets densely hairy underneath but with much less hairy

capsules. It has an excellent timber which is tough but easily worked, and useful for making planes, mallets and chisel handles.

WRIGHTIA

(After Dr. William Wright)

A small genus, dispersed over tropical Asia. The three Australian species are endemic.

Wrightia Millgar (native name): Usually a small tree, but sometimes attaining a height of about 80 feet, and native to Queensland and North Australia. It has slender branches and opposite, linear leaves 3 to 6 inches long; flowers in terminal cymes, the seeds long with a tuft of hair at the end. The pale-yellow wood resembles English Cedar, is uniform in colour, close-grained, and recommended for cabinet-work and carving.

XANTHORRHOEA

(Referring to the flow of yellow resinous matter from the trunk)

The genus of eleven species is limited to Australia, where in several districts, under the name of Grass Trees or Blackboys, some of the species form a conspicuous feature of the landscape. They are long-lived perennials with thick woody trunks of 6 to 8 feet in height, which are covered by the bases of the old leaves, and terminate in a rosette of narrow linear leaves 3 feet or more in length and with an upright spike of whitish flowers on a long stalk, occasionally making a total height of 12 to 15 feet. Flowering is irregular but usually takes place after a bush-fire. The flowers are numerous, sessile, closely packed and with numerous bracteoles surrounding each flower with a small or subulate subtending bract. The trunk in several species emits a copious yellow or dark-yellow, acaroid resin, which is of commercial value, being used in particular kinds of varnishes, in the manufacture of sealing-wax, as a resinous glaze for confectionery, and also in cabinet-work and for other technological purposes. It yields picric acid largely under the action of nitric acid, and this resin is obtainable in inexhaustible quantities, as the plants producing it are abundant throughout Australia.

Xanthorrhoea arborea (tree-like), known as "Dackowar" and great Resin Grass-Tree, and found from Port Jackson to the Blue Mountains, New South Wales, and extending to Rockhampton, Queensland. This species attains 20 feet or more in height, with a diameter of 12 to 18 inches, the leaves are 3 to 4 feet long, and two to three lines broad, the scape under the spike attaining 5 to 6 feet, and the spike itself 3 to 4 feet long, and 1 to 2 inches in diameter when full grown,

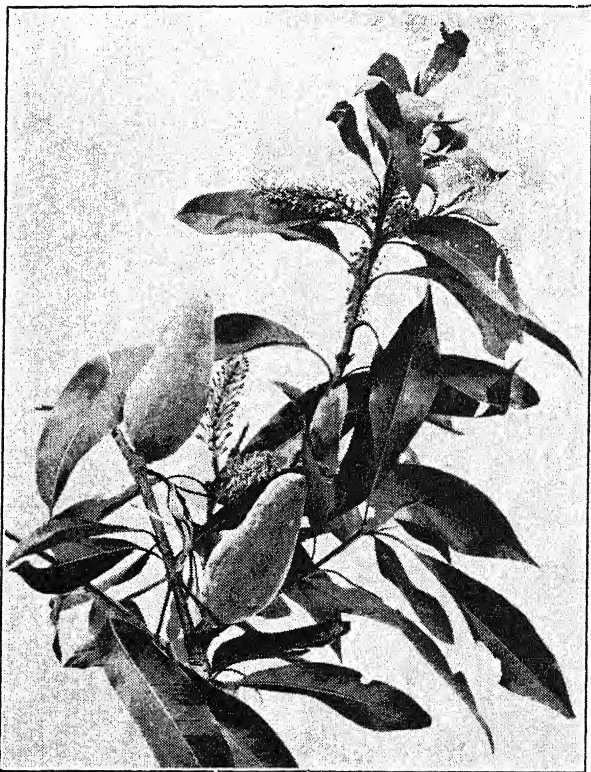
the capsule seven to eight lines long and more acuminate than in other species.

XYLOMELUM

(Woody Pear)

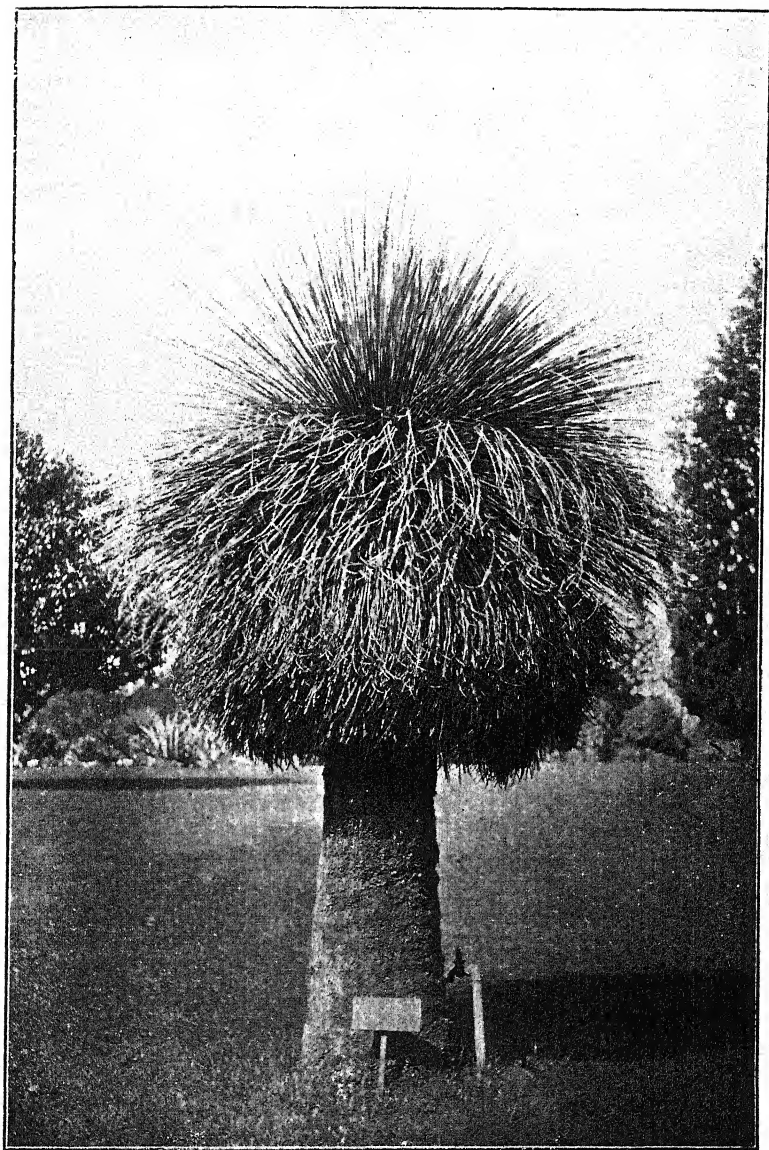
The genus of five species is endemic to Australia, where it is widely spread, and known under the name of Wooden Pear. The fruit is like a small pear attached to the stalk by the thick end, not succulent but woody. Three species grow in the east and two in the west of Australia.

Xylomelum angustifolium (narrow-leaved), the Western Australian Wood Pear, is a small tree. Its large, dark-green leaves are 4 to 8 inches long and red when young, the flowers light-brown on one crowded spike. The timber is close-grained and prettily marked and used for picture-frames, veneers, etc.



N.S.W. Government Printer, photo.

Flowers, seed-vessels and Leaves of the Native Pear
(*Xylomelum*)



W. R. Guilfoyle, photo.

Xanthorrhoea arborea (Grass Tree)

Xylomelum pyriforme (pear-shaped): The Wooden or Native Pear of New South Wales and Queensland, which reaches a height of 25 feet, has hairy, young shoots and flowers, ovate-lanceolate leaves, some entire and others sharply serrated. The fruit is 2 to 3 inches long. The timber is dark-red, coarse-grained, prettily-figured suitable for cabinet-work.

Xylomelum salicinum (Willow-like): A small tree with leaves 4 to 8 inches long, whitish flowers, and the narrow fruit recurved at the end. Its habitat is from Moreton Bay to Cape York Peninsula and Thursday Island. The wood is dark-red, close-grained, tough and durable, and useful for ornamental cabinet-work.

ZANTHOXYLUM

(Yellow-wood)

A large genus dispersed over the tropical and sub-tropical regions of the world. Of the five Australian species four are endemic to Australia, the fifth is also in Norfolk Island.

Zanthoxylum brachyacanthum (alluding to the short prickles): This is exceptional among Australian trees in being semi-deciduous, and known as Queensland Satinwood, Thorny Yellow-wood, or Slender Scrub Tree, the stem and branches being covered with short, conical prickles. It grows from 30 to 50 feet with a 6-inch diameter, in the southern ranges of Queensland to the Clarence River, New South Wales. The alternate, pinnate leaves are 2 to 3 inches long, the white flowers nearly three lines long, and the bark light-gray. The timber is useful for furniture and ornamental work, veneers, picture-frames, etc., it being canary-yellow in colour (hence the name of the genus), decorative, polishing well, close-grained, strong and durable, moderately hard and heavy (48 lb.), also used for railway waggons and carriage-work. The colour deepens when exposed and will fade unless polished or varnished. It is alleged that this wood is superior to the wood used in England under the name of "Satin-Wood."

Zanthoxylum veneficum (poisonous) occurs on the north coast of Queensland, of moderate size, and called Poison Tree. The bark possesses a poisonous principle as tonic as strychnine. The leaves are oblong-lanceolate, 6 to 12 inches long, leaflets five to nine opposite in pairs, the white flowers in panicles at the end of branchlets. The wood is yellow, close-grained and easy to work.

APPENDICES

INTRODUCTION

From the earliest days of settlement Australian vegetation has received much attention and close observation by European botanists. Australia's remoteness from the old world, the marked contrast in its vegetation with that of other countries, and its great diversity of form and character, were factors inviting examination of its peculiar features.

The build and contour of the Continent have been important agents in determining the character of its vegetation. While generally speaking two families of plants, the Eucalypts and the Acacias, stand out as prominently characteristic, there is a notable diversity in plant forms, ranging from the rich, tropical luxuriance of the North, to the Alpine flora of the South-east; the profuse forestal growth along the Pacific slope with the scantily timbered or almost treeless plains beyond the Western slope of the Dividing range; the densely forested areas in Gippsland, Cape Otway, and the South-west of Australia, with the gradual declension to scrubby and herbaceous growth towards the dry inland spaces; or the intensely arid central regions fringed with, in some areas, increasing vegetation towards the coast.

The spread of settlement, frequently causing destruction, or marked alteration of the natural growth, has made drastic changes, and created problems for serious consideration: climatic changes, extensive aridity, erosion of surfaces, increasing deterioration of much arable land, and diminution of pastoral and agricultural areas by sand-drift from the interior desert spaces. In addition, noxious weeds and introduced animals disturbed the balance of nature. Only long-continued remedial measures can combat or remove the effects induced by these detrimental agencies. Re-afforestation of native trees, afforestation generally, conservation of water, wisely directed irrigation, application of the best scientific methods in agricultural and pastoral industries, are all indirectly connected with some aspect presented by Australian vegetation, its preservation, adaptation, and the many interests with which it is associated in our national industrial life and welfare.

The magnificence, or loftiness of the trees, and the great beauty of the shrubs and flowers that are to be met with on all sides, contrasted with the gorgeousness of their blooms, the variety of form and greenness of their foliage, and their hardy nature, on the whole fortify them in adapting themselves to various climates, moisture, etc.

One has only to observe the collection of Australian plants which may be seen growing in the public gardens of each State, to quickly be convinced of the fact that, when properly attended to, native trees, shrubs or whatever they may be, flourish to perfection when brought together from practically all parts of the Continent.

Our Eucalypts, Acacias, Eugenias, Grevilleas, Flindersias, Callistemons, Sterculias, Melaleucas, Cassias, Hakeas, and Pittosporums, and hundreds of other brilliant evergreen and gorgeous flowered trees, that are readily procurable and easily grown, are often neglected in the ornamentation of parks and gardens, in favour of exotic vegetation which, in the majority of cases, is less hardy or picturesque.

PRESERVATION OF FORESTS

Security of our forests is one of the first interests of the community, and consequently one of the first duties of Government. All the needs of life are closely related to their preservation; agriculture, architecture, and almost all the industries seek therein their provision of support and supply, which nothing could replace.

Necessary as are forests to the human being, they are no less so to the State. It is for this reason that commerce finds the means of transportation and exchange, and the governments claim, the elements of their protection, their safety and even their renown.

It is not alone from the wealth which they offer by their producing, under wise regulation, that we may judge of their profitableness. Their existence is in itself of incalculable value to countries that possess them, as well in the protection and feeding of springs and rivers, as in prevention against washing away of the soil upon mountains and in beneficial and healthful influence which they exert upon the atmosphere.

Extensive forests deaden and break the force of weighty winds that beat out seeds and injure the growth of plants; they form basins of moisture; they shelter the soil of the fields; and upon hillsides, the rain waters, checked in their descent by a thousand obstructions they present by roots and the trunks of trees, have time to filter into the

soil and only find their way by slow degrees to the rivers. They regulate in a certain degree, the flow of waters and the readily absorbing condition of the atmosphere, and their destruction accordingly increases the duration of droughts and gives rise to the injuries of inundations, which denude the face of mountains.

The destruction of forests has often become to the country where this has happened a real calamity and a quick cause of approaching decline and ruin. We should provide against these errors, which may take centuries of perseverance to repair.

Nevertheless, there is another and more cheering era in this relation. This is when regular life has advanced, and man, under the safeguard of laws, sets about restoring the desolated forest. The cultivation of wood then becomes an art founded on principles, for the purpose of utility. The planter who labours from choice, experiences gratification in his business, and small trees which he places in the ground quickly become part of the landscape, and thus gustation is rewarded almost as soon as the work is done.

In a few years more, his collection of trees yields shelter from the winds, and thus increases the value of the land.

Land-owners should be inspired with correct ideas as to the importance of planting and protecting trees and taught the profits that may be derived from planting waste areas with timber. They should learn the increased value of farms which have the roadsides lined with avenues of trees, and should understand the worth of the shelter which belts of timber provide to enrich and beautify their properties.

Few people have any idea of the immense value of the wood which is used for purposes generally considered unimportant. Trees will grow in places where nothing else can be cultivated. A soil too coarse and destitute of richness for cereals may be wonderfully productive in forest growth. A deep hollow pass between mountains and slopes too steep for any other useful product is the favourite seat of timber. It is known and proved that three-fourths of the surface will produce more, if protected by trees planted on the other fourth, than the whole would without the trees, and without the protection. With assumed importance the owner loses nothing in the process of production on his farm, but, on the other hand, he increases the certainty of his crops, decreases one-fourth his labour, beautifies his home, improves the climate, doubles the value of his land, receives infusion in the work of his own hands, raises his own property, and adds to the high culture of himself, his family, and all his surroundings.

IMPORTANT TIMBER TREES

Australia's forests consist chiefly of hardwood trees, the family of Eucalypts—popularly known as gum trees—spreading over 90 per cent. of the timber country. The chief forest territory is the moister highlands and coastal belts; principally because of unfavourable climatic and soil conditions, only a very small proportion of the rest of the continent is forested. It has been calculated that over 30,000 square miles of forest are capable of being used to advantage for permanent reservation for commercial timber production.

For the reason that there is an insufficiency of indigenous coniferous forests, Australia normally imports large quantities of softwood timbers, mainly from Canada, Norway, Sweden, and the United States of America. In 1944-45 imports of dressed timber totalled 6,000,000 super feet, while imports of undressed timber, embracing logs, collected together a further 86,000,000 super feet. These imports consisted almost entirely of softwoods.

The chief timber-producing forests of Australia are located on a circumscribed coastal fringe in the eastern and southern portion of the mainland, in Tasmania, and in the south-western corner of Western Australia, where the rainfall is adequate to support tree growth in close occupation.

A great number of the hardwoods, comprising White Mountain Ash, Blackwood and Red Stringybark, take a polish and exhibit a beautiful grain which is not inferior to any of the best-known furniture timbers. The tropical forests of New South Wales and Queensland supply many beautiful cabinet timbers, which are in great demand, such as Black Bean, Silky Oak, Maple, Walnut, Rosewood and Red Cedar. From the latter State comes the well-known and very useful softwood, *Araucaria Cunninghamii* (Hoop Pine) and *A. Bidwilli* (Bunya-Bunya Pine). Western Australian Jarrah has earned a high reputation for its wide range of uses, is very durable in the ground, resists white-ant attacks, and it has been known to withstand fire to a remarkable extent. Karri, also from Western Australia, is a fine construction timber; and Grey Box, Ironbark, Grey Mountain Gum, Red Gum and Blue Gum, are all renowned for strength and durability. Victoria is famed for its White Mountain Ash, which is used extensively for fencing, house construction, and interior decoration.

Eucalypt trees are planted in great numbers in the west of North America and in North, South, and West Africa, where the climate is similar to Australia. They may be seen in almost every place in South Africa, principally in the towns

and cities, where they are more numerous than any other trees. It is well to remember that they belong to Australia only, with the exception of a few species indigenous to Timor, and a few adjacent islands. If they are found growing in any other part of the world we know they have been planted there, and are not in their true home, Australia.

Many people are not aware that there are as many as three hundred and sixty kinds (or species) of Eucalypts, and are much surprised when told. A great deal could be said about the timber of Eucalyptus, which was known at once to be very valuable when it was first seen by white people, on their arrival in this country. When they found how valuable it was they sent large consignments to England by the very first ships on their return journeys, and ever since it has been recognized to be as good as any timber in the world. In fact, they are the most preponderant and most characteristic endemic vegetation of the Australian forests. Their value has now been recognized throughout the world, and their cultivation has been introduced with good results into Italy, North America, South Africa, Mexico and Russia—the latter nation has reached the conclusion, or result, from experiment, that the Eucalyptus is one of the most valuable trees in the world. According to an Australian Associated Press message, Russia, by its five-year post-war plan, will have 11,000,000 Eucalypts. The genus Eucalyptus, which comprises about 250 species, comes second only to Acacia in point of number amongst Australian genera, but it is so widespread and so abundant, that it is doubtless the most numerous in distinctive character of any. It is, however, very easily recognized by the operculum of the flower-bud.

In consequence of the Eucalypts being the most difficult family of trees to determine specifically, though not generally, various modes have, from time to time, been adopted by botanists for that purpose; but it is only by seeing them in a living state that phytographic mistakes can possibly be avoided. The leaves and fruit of many of them are identical, while the bark is quite dissimilar, and vice versa, so that their determination merely by individual characteristics would be altogether impracticable, while to do so from dried specimens, however perfect, is frequently no less embarrassing. But I have not the least hesitation in saying that, if it were possible to see all the species growing together, the classifier could do in an hour what has taken years to partially accomplish. But I shall not in this brief sketch, attempt to suggest any new method for their specific determination, but give the reader a general description of the most useful kinds, from which, should he wish to make them a study, he cannot possibly fall into error.

A knowledge, therefore, of the tree in its living state—and that, too, in its various stages of growth—as well as of the character and extent of its bark, seems necessary for fixing the species with any degree of certainty.

The Blue Gum (*Eucalyptus globulus*) is well known for its high reputation as a hygienic-agent in damp, unhealthy, and malarious situations, and has hence been planted extensively abroad. Its value has been alternately ascribed to the antiseptic action of its camphor-like odours, and to its rapid growth (which sometimes even exceeds fifteen feet per annum), and the consequent drainage of the soil through the enormous transpiration from the leaf surfaces.

It is a tall tree, attaining a maximum of 250 feet at about 250 years of age, with smooth, deciduous bark, bluish white. It furnishes a first-class wood, equal to the best English oak, American white oak and American ash. Bluegum wood is very extensively used for all kinds of outdoor work, joists and studs of wooden houses; also for fence rails, telegraph poles, railway sleepers (lasting ten years or more), and a variety of other purposes. It is a native of south, north-east, north-west, and eastern Victoria, usually in valleys and moist declivities of wooded mountains up to the snow line, Apollo Bay, Mt. Cole (Beaufort), Beechworth, Neerim, Korumburra, Foster, Toora, Victorian Alps, Baw Baw Mountains, and National Park, Wilson's Promontory. Also in Tasmania; very rare in New South Wales, but very widely planted.

The Messmate Stringybark (*Euc. obliqua*) is remarkable as having been the first species of Eucalypt known to Europeans—attaining a height of 300 feet with a stem more than ten feet in diameter, growing mostly in mountainous country and content with poor, dry soil. The most gregarious of all Eucalypts, from Spencer's Gulf to the southern parts of New South Wales, and in several varieties designated by splitters and other wood-workers by different names. Most extensively used for building purposes of all kinds. The bulk of wood obtained from this tree in extremely poor soil is perhaps larger than that of any other kind, and thus this species can be easily re-disseminated, among the trees for new forest plantations in barren, woodless tracts, with a view to obtaining a ready and early supply of cheap and fissile wood. This species differs from other stringy barks in having the capsule more or less sunk.

Widely spread in Victoria, usually on hills and extending from Gippsland to the Grampians and Otways, and near Melbourne on the basalt, silurian and red sand areas. Also in Tasmania and South Australia. In its truly typical form it scarcely reaches the southern limits of New South Wales.



Forests Commission of Victoria.

Euc. globulus (Blue Gum)

The River or Red Gum (*Euc. rostrata*) has a very wide range, and is highly valued for its industrial and medicinal properties. It frequently attains a great size, and when growing luxuriously by the side of the river, it has often been an object of admiration to explorers. It will thrive in ground periodically inundated for a considerable time, and even in slightly saline places. The timber is one of the most highly esteemed in all Australia among that of Eucalypts, being heavy, hard, strong and extremely durable, either above or underground or in water. For these reasons it is very much prized for fence posts, piles and railway sleepers. For the latter purpose it will last at least a dozen years, but if well selected, much longer. Indeed, officials of the Railway Department in Victoria report that sleepers were found quite sound after being 25 years in use. It is also extensively employed by ship-builders for main-stem, stern-post, inner-post, dead-wood, floor timbers, futtocks, transoms, knighthead, hause-pieces, cant-stern-quarter and fashion timbers, bottom-planks, breat-hooks and riders, windlass and bow rails. At Sale, in North Gippsland, a great number of Red Gum trees have been killed by the larvae of a nocturnal Lepidopterous insect, *Urubra lugens*. They eat away the epidermis of the leaves on both sides, thus asphyxiating the tree. It seems that other insects also affect injuriously various Eucalypts in a similar manner. Widely spread in Victoria from the Yarra to the Murray; Heathcote, Stawell, Dimboola, Wangaratta, Yarra, Barwon, Echuca, Upper Murray, Grampians. Also in all States, except Tasmania.

Yellow Box (*Euc. melliodora*) is a tree of moderate size. It is placed among the half-barked trees, because the bark, though for the most part persistent on the stem, scales off from the branches. The inner bark is of a yellowish colour, and the flowers have the scent of honey. The wood resembles that of *Euc. rostrata* in texture, but is of a paler colour, and not quite as durable; it is fully as strong, though second to that of *Euc. leucoxylon*, *Euc. siderophloia* and the best *Euc. globulus*; it is esteemed by wheelwrights and other artisans, in ship-building, and supplies excellent fuel.

Widely spread in Victoria and near Melbourne on both the basalt and silurian areas. In Gippsland, Tambo, Gram-pians, Chiltern, Maryborough, Myrniong and Victorian Alps. It prefers good soil, and stands hot, dry winds well, but not severe cold, requiring a rainfall in Victoria of fifteen to twenty inches. It also occurs in New South Wales and Queensland.

Blackbutt (*Euc. pilularis*) (the specific name of which is not well chosen, seeing that other species have fruits more



Forests Commission of Victoria.

Euc. rostrata (River or Red Gum)

pillular in shape), is a half-barked tree, rising to a height of 150 feet and upwards. This species prefers a good soil, and is of rapid growth. The young saplings have opposite leaves, sessile, and of a lanceolate shape. It is one of the best timber-yielding trees. Its stem-expanded buttresses often exceed 50 feet at the base; the stem, with a measurement 40 feet in circumference at six feet from the ground. More branching out when young than many other species, and thus fitter for storm-exposed localities. Timber much used in flooring-boards, also for railway sleepers and telegraph poles. A native to the north-eastern and eastern Victoria, along the Macalister River, in Gippsland, Sealer's Cove, National Park. Also in New South Wales and Queensland.

Red Ironbark (*Euc. Sideroxylon*).—A medium-sized tree, 40 to 60 feet, and two to four feet diameter, sometimes 100 to 150 feet high, with a dark red or dark brown, rough, persistent bark, spotted with dark kino grains. Widely spread in Victoria, except in the north-west, and near Melbourne confined to the silurian area. In Gippsland, Panton Hill, Bendigo, Maryborough, Rushworth, Chiltern, Grampians. Also in New South Wales, Queensland, and South Australia.

Grey Box (*Euc. hemiphloia*) is the common "Box," and forms a large part of the forest trees, indicating generally good grazing country, and rising to 100 feet and more in height. In this species the anthers are very minute, the leaves large, and the valves of the fruit enclosed. Regarded as a tree of great excellence. It is famous for its hardness and toughness of its timber, which is used for railway sleepers, telegraph poles, shafts, spokes, mauls, plough beams and similar articles. It makes an excellent firewood. The variety *Euc. albens* is known as "White Boxtree." A native of north-west, north-east and south Victoria. At Beaufort, Rushworth, Murchison, Carisbrook, Loddon River, and near Melbourne confined to the silurian area. Also in New South Wales, Queensland, and South Australia. The type form appears to be less common in Victoria than in New South Wales, and some of the above localities may refer to the variety *Euc. Albens*, already referred to. In New South Wales this covers large areas of forest country.

Spotted Gum (*Euc. goniocalyx*), sometimes called Bastard-Boxtree, but usually known as Spotted Gumbtree. From Cape Otway, but it extends to New South Wales as far as Braidwood. It derives its specific name from the prominent angles of the calyx. In the rich forest valleys of Victoria this tree is said to attain the great height of 250 feet, and I regard it as one of the Eucalypts most deserving of cultivation. A stunted variety of this species, with fibrous bark on the butt,

occurs on the ridges beyond Mudgee in New South Wales. Its wood resembles in many respects that of *Euc. globulus*, and is, comparatively speaking, easily worked. For house-building, fence rails and similar purposes it is extensively employed in these forest districts, where it is abundant, and has proved a valuable timber. Meltitose is formed occasionally on this, and also on *Euc. Gunnii*. In this species and others the author counted more than one annual wood-rings without clearly visible act of marking of yearly increase or augmentation. Its timber is pale yellow to brownish, splits well, hard, heavy, and close grained. A cubic foot weighs 53 to 56 lb. Transverse breaking stress (3 ft. x 3 in. x 3 in.), 8,000 to 9,000 lb. It prefers the moister, cooler southern slopes of ridges to the drier northern slopes.

Red Stringybark (*Euc. macrorrhyncha*) is the common Stringybark tree of Victoria, not extending far into New South Wales, but occurs in South Australia. Usually on silurian clays and on stony ridges up to an elevation of 3,000 feet. This tree attains a height of 120 feet. The wood, which contains a good deal of kino, is used for joists, keels of boats, fence rails, telegraph poles and rough building purposes, also extensively for fuel. The fibrous dark brown bark serves for roofs of huts, and also for rough tying. The wood has proved by experiments nearly as strong as that of *Euc. globulus* and *Euc. rostrata*, and considerably stronger than that of *Euc. obliqua*. The fresh bark contains from 11 to 14 per cent. of pure kino-tannic acid. The kino contains about 72 per cent. of tannin. It is soluble in water, as well as in alcohol.

Forest Red Gum (*Euc. tereticornis*) is one of the commonest gums, and in different districts is known as "Grey, Red, or Blue Gum" and "Bastard Box." Though distinguished by its bark, wood, and broad and very prominent rim of fruit, the species is subject to great variation in the length of the operculum, the shape of the leaves, and the size of the capsule, whilst, in moist places, the umbel often exceeds the typical number of flowers. In relation to the anthereal system, it is allied to *Euc. rostrata*, but the two trees differ altogether in habit, the one being a forest tree, and the other being truly a river gum.

Its distribution extends from Eastern Queensland, where it is termed Red Gumtree, to Gippsland (Snowy River, Mitchell River, Macalister River, Badger's Creek, Metung, Tambo River, Stratford, Cunningham, Bairnsdale, Briagolong, Maffra, and Yarram, etc.). A fairly tall tree, 80 to 150 feet high, and up to a diameter of three to six feet, with a smooth, whitish or greyish bark shedding in thin layers. The timber is esteemed for the naves and felloes of wheels. For telegraph

poles and railway sleepers, it is inferior to some of the iron-bark trees, lasting a shorter time. It is immune to the ravages of attacks by the termites, and is not subject to decay from dry rot. Quite underground it remains sound longer than most Eucalypts; but much depends, as regards its durability, on the locality where it is obtained, and the manner of drying, a remark which applies also to many other Eucalypts. As I have already mentioned, the difference between *Euc. rostrata* and *Euc. tereticornis* lies in the operculum, and in forest plantations of both forms, even though the seed was obtained from localities where hybridity seemed inconsistent with the laws or course of nature *Euc. rostrata* is according to the principles of botany, simply a variety of *Euc. tereticornis*. The timbers of both species are very similar, and are used for the same purposes, but that of *Euc. rostrata* is perhaps found in greater quantity, while that of *Euc. tereticornis* is equally hard and durable. Although both trees love water, they can be killed by extended flooding or by a decided lasting rise or fall in the level of the water surface in the soil. A cubic foot averages 60 to 61 lb. when seasoned, and 45 lb. dry. Transverse breaking stress (3 feet x 3 inches x 3 inches), 6,500 to 9,000 lb.

Red Boxtree (*Euc. polyanthemos*), sometimes called "Lignum Vitae or Bastard Box," is a tree of moderate size, with a rough bark persistent on the stem and branches. This species, which is remarkable for the toughness of its wood, grows on the banks of creeks, usually in coastal districts, but sometimes as a forest tree. It is found beyond the Dividing Range in New South Wales. In Gippsland, along the Ovens River, Euroa, Lilydale, Buchan, Heathcote, Chiltern, Maryborough, Bendigo, and near Melbourne confined to the silurian area. It usually grows on the lower slopes of hillsides, and on poor soils. The timber is hard, strong, tough, durable, dark red; sapwood pale yellow to white, a valuable timber when of sufficient size and of straight growth for fencing, sleepers, also for wheelwright's work. For fuel this wood is not surpassed. It is extremely strong, excelling oak and ash in transverse strength among Eucalypts such as *Euc. leucoxylon* and *Euc. siderophloia*.

Manna Gum (*Euc. viminalis*).—A tree usually small, along the coast. On poor soil, only a moderate-sized tree, with a dark, rough bark on the trunk. However, in rich soil of the mountain forests it attains gigantic dimensions, rising to a height of 250 feet, with a stem occasionally to twelve feet in diameter. It has there a cream-coloured, smooth bark, and is known as White Gumtree. The timber is light coloured, clear, though not so strong and durable as that of many other

kinds of Eucalypts. The wood of this, of *Euc. globulus*, *Euc. mellidora* and some others, is occasionally bored by the larvae of a large moth, *Endoxyla Eucalypti*, and also by two beetles, *Phoracantha tricusps* and *Hapatesus hirtus*.

Some of the forms of *Euc. viminalis* are difficult to distinguish from *Euc. dealbata*, which it resembles in appearance, but it seems to differ in its glaucous appearance, the leaves ovate lanceolate with more divergent veins, the intramarginal one farther from the edge. Fruit, hemispherical; rim, flat or slightly convex.

Habitat: Widely spread, except for north-west in Victoria, in fertile districts on the plains as well as on the hills. Usually in cool, moist localities near rivers or on flats. Barwon Heads, Wanda Vale, Portland, Port Fairy, Geelong, Beaufort, Bruthen, Healesville, Macedon, Maryborough, Castlemaine, Victorian Alps and Wilson's Promontory.

Timber: Pale yellow, usually weak, rather brittle, apt to warp and twist, and not very durable.

White Stringybark (*Euc. eugenioides*).—A tree, sometimes attaining a height of 150 feet, but usually 50 to 100 feet, with fibrous furrowed bark up to the smaller branches, usually greyish outside, then brown and reddish or yellow on the inside, but hard and dense on the outside. The tree is abundant in some localities, and attains considerable dimensions. It approaches very near to *Euc. capitellata*, and perhaps is only a variety of it. The chief difference is that it has narrower leaves, shining on both sides and calyxes often attenuated into short stalklets. *Euc. capitellata* is the form of stringybark which occurs most frequently near the coast. Although it is so closely allied to *Euc. eugenioides*, its umbels of flowers are capitate. It is a very useful wood for building purposes and fencing. Rails used for 40 years could be re-used in new posts. It is a rapid grower, is free from gum veins, and is a generally useful timber, which splits readily, and can be used for wood carving. Young trees make good telegraph poles. A cubic foot of air-dry timber weighs 53 to 55 lb. and 72 lb. green. It forms useful fuel, especially for burning bricks, and leaves a yellowish brown ash.

A native of south and east Victoria, in Gippsland, Stratford, Bairnsdale, Buchan, and also in the mountainous regions (Macalister River, etc.) up to 3,000 feet; near Melbourne confined to the silurian areas. Also in New South Wales and Queensland.

The tree seeds freely, and readily regenerates by natural reproduction if stock are kept off the land. It does not thrive under hot, dry conditions, stands moderate frost, and

prefers a cool, moist climate. The bark yields rough cordage and matting.

Silver-top (*Euc. Sieberiana*) (the *Euc. virgata* of some botanists) is the tree known as Silver-top, Gum-top, or even Ironbark. It is a half-barked tree, the bark of the butt being black or dark coloured, and deeply furrowed like Ironbark, whilst the branches are smooth and sometimes white. It grows to a height of 100 to 150 feet, and three to five feet in diameter. In Gippsland it ascends to an altitude of 4,500 feet. A straight-stemmed tree, quickly growing, wood of excellent quality, strong and elastic, hence used for many building purposes, such as furniture, house-building, ship and boat building, implement handles, staves and casks. The wood is of a pale brown, but rather darker than that of *Euc. regnans* and *Euc. gigantea*, and often marked by dark spots. It splits readily, is hard and usually free from gum veins, but is not very durable in the ground or where exposed to the weather.

Systematically, the species is very closely allied to *Euc. haemastoma*, but much superior as a timber tree. Often it only forms seed every two or three years, and as it is rather sensitive to bush fires, may fail to regenerate if the fire occurs in a bad season year.

The preservation of this tree is consequential in maintaining water supply areas, and in preventing mountain erosion and floods. Where it grows at an elevation of 2,000 feet, it is so valuable for this purpose that it is questionable whether cutting of it should be permitted except under most rigorous control. It is regarded as an alpine species, usually on rocky mountain ranges with poor, granite, sandstone, or slaty soil, and often confined to the southern slopes. On rich soils of low elevations it is of very rapid growth, and timber of excellent quality. White ants often attack it when growing at low elevations, and often it is fistular or piped.

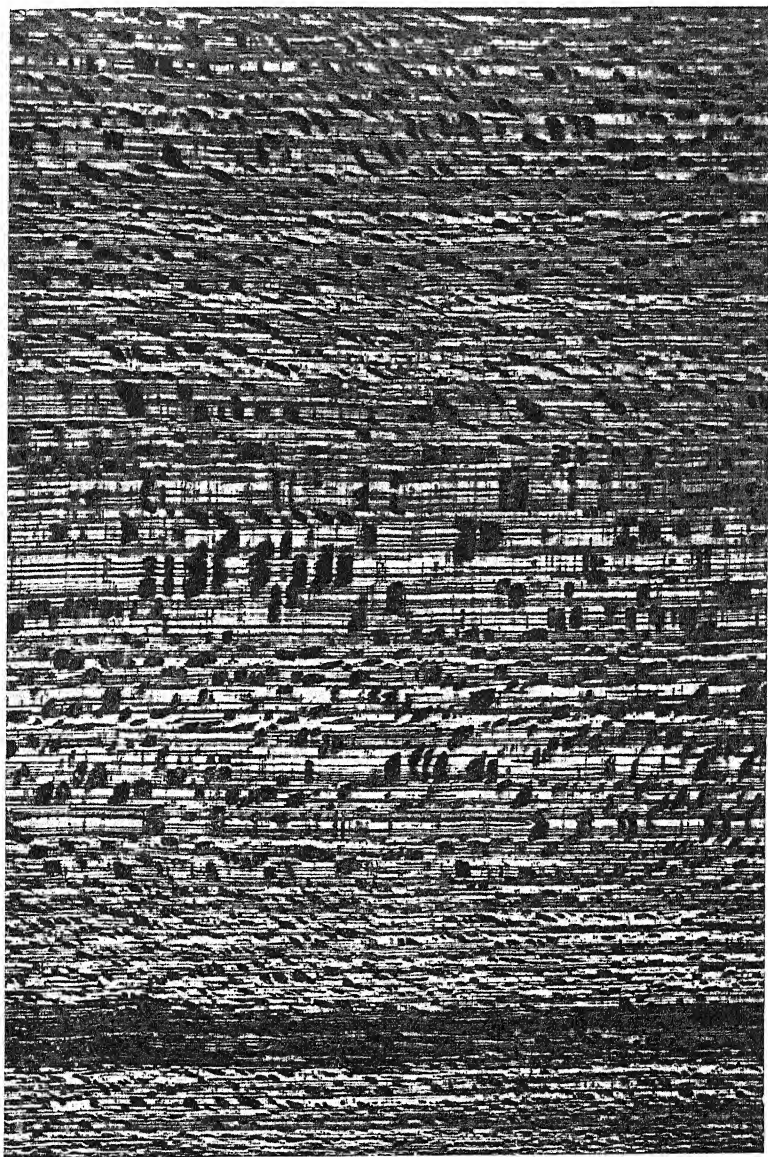
A native of north-east and eastern Victoria, Gembrook, Nar-Nar-Goon, Buffalo Ranges, on ridges along the Ovens Valley and in Gippsland, and Victorian Alps. Also in New South Wales and Tasmania.

White Mountain Ash (*Euc. regnans*).—A very large tree, with a smooth bark, and only found in the southern forests of New South Wales. In Victoria it attains a height of 327 feet (and represents the loftiest tree in the British dominion), there forming a smooth stem and broad leaves. Owing to the great height of the tree, and its valuable character, the leaves are not used for oil, although it has a volatile oil content of 3.313 per cent. The oil is red in colour when first distilled, and consists mainly of phellandrene, eudesmol with sesquiterpene, geraniol.



Forests Commission of Victoria.

Giant *Euc. regnans*



Tarrietia argyrodendron
(Crowsfoot Elm)

and a trace of cineol. The timber has fairly large pores, as in Messmate Stringybark (*Euc. obliqua*), but is paler, with prominent annual rings, free from gum veins and not very durable in the ground. It is straight in grain, moderately hard, splits easily, seasons well, particularly if cut on the quarter, and is one of the most useful hardwoods, equal to the best ash, oak, or hickory for flooring, furniture, beams, planks, and weatherboards. The latter require oiling where exposed to the weather. A cubic foot weighs 40 to 50 lb. when air-dry, 63 lb. green, and 37 lb. completely dry. Transverse breaking stress (3 ft. x 3 in.) 4,000 to 5,000 lb.

A native of eastern Victoria, in the Otway Ranges (where it attains colossal size and dimensions), Noojee, Yarra Ranges, and South Gippsland. Also in the north-eastern ranges, usually on moist slopes and hillsides on good soil of mesozoic carboniferous formations at elevations of 1,000 to 2,000 feet. Also in Tasmania and New South Wales. It is very sensitive to bush fires, and often fails to re-establish itself by natural regeneration.

Eucalypts may to some extent be judged from the average percentage of oil in their foliage, as stated beneath.

<i>Euc. oleosa</i>	1.250	per cent. volatile oil.
<i>Euc. leucoxylon</i>	1.060	" " " "
<i>Euc. goniocalyx</i>	0.914	" " " "
<i>Euc. globulus</i>	0.719	" " " "
<i>Euc. obliqua</i>	0.500	" " " "

The lesser quantity of oil of *Euc. globulus* is, however, compensated for by the vigour of its growth and the early copiousness of its foliage. The proportion of oil varies also somewhat according to locality and season. *Euc. rostrata*, though one of the poorest in oil, is, nevertheless, important for malaria regions, as it will grow well on periodically inundated places, and even in stagnant waters not saline.

Brown Stringybark (*Euc. capitellata*).—One of the Stringybark trees of south-eastern Australia, extending to the dry Mallee country, attaining occasionally a height of 200 feet. The timber is principally used for fence rails, furniture, and other building purposes. It is tough, hard, strong and durable, usually splitting readily, brown when fresh, paler when dry. The tree seeds freely, stands small bush fires fairly well, and regenerates readily by natural reproduction if stock are kept off the land.

The thick, fibrous bark is often used for roofing huts, but easily catches fire. It yields a coarse, rather weak fibre. Field variation of this species suggest the occurrence of segregating hybrids between *Euc. capitellata* and *Euc. eugenioides*.

Widely spread, Beaufort, Stawell, Ararat, on the Grampians, at Wilson's Promontory, Gembrook, Nar-Nar-Goon, Upper Yarra, Healesville, Marysville, and near Melbourne confined to the silurian areas. Also in New South Wales and South Australia. It usually grows at elevations of over 500 feet, and is of considerable size, but a smaller form or variety (*Euc. Baxteri*) grows in the Grampians, and descends to the coast in the Western District of Victoria and New South Wales. The oil distilled from the leaves contains cineol about 25 per cent., pinene, sesquiterpene, and a little phellandrene. The fresh leaves yield about 0.1 per cent. of a red oil of rank aroma. Flowers much used by bees for pollen. Flowering in February and March, usually for two years in succession, and then for one or two years without flowers. Honey rather dark, but clear and of pleasant flavour.

Yellow Stringybark Tree (*Euc. Muelleriana*), Wilson's Promontory, Gippsland and Fish Creek, up to elevations of 1,000 feet, on silurian sediments, sands and sandy clays. Also in South Australia, New South Wales and Queensland. Maximum height of 170 feet, with a straight rather massive bole, often over 3 ft. diameter. The wood is dark, fissile, free from kino veins or shakes, clear in the grain and very durable, used for splitting and sawing. Fence posts of this timber have been known to last for more than 30 years. The fibrous dark grey bark, smooth on the smaller branches, the inner bark usually yellow. Fresh leaves yield about 0.7 to 0.8 per cent. of oil, consisting mainly of pinene and reddish in colour. The kino contains mainly tannic acid and water, but no gum. Honey somewhat dark, but of good flavour and consistency. A good pollen yielder, usually flowering annually from December to March.

Yellow Gum (*Euc. leucoxylon*).—A medium-sized tree, sometimes attaining 60 to 90 feet, with a smooth, whitish bark, rarely rough at the butt. It supplies a most valuable timber; this shows great strength and hardness, is much prized for its durability by waggon-builders for wheels and poles, by ship-builders for top-sides, tree-nails, the rudder (stock), belaying-pins, and other purposes; it is also used by turners for rough work; it proved to be the strongest of all woods hitherto subjected to test, bearing nearly twice the strength of American oak and ash, and excelling even hickory by about 18 per cent. It is much recommended for railway sleepers, and extensively used in underground mining work. The Railway Commissioners of Victoria have reported sleepers laid 25 years ago, still quite sound. It is likewise very extensively employed for the handles of axes and other implements by Victorian manufacturers. As it is for some purposes superior

to that of almost any other Eucalypt, the regular culture of this tree over wide areas should be fostered, especially as it can be raised on stony ridges not readily available for ordinary husbandry. The wood is sometimes pale, in other localities rather dark. The tree is generally restricted to the lower Silurian sandstone—and slate formation with ironstone and quartz. Nevertheless, it accommodates itself to various geologic formations, thus even to limestone ground. The bark is remarkably rich in kino tannin, yielding as much as 22 per cent., in the fresh state, but less after drying; the fresh leaves contain about 5 per cent. and the dried leaves 9 to 10 per cent., but is not equal to wattle bark. The flowers are sought by bees, even more eagerly than most other Eucalypts, the resulting honey being excellent. It is pale straw colour, dense, clear, mild in flavour. Pollen little used. Flowering annually, but more abundant in alternate years. *Euc. Sideroxylon* is the rough-barked variety, but has been retained as a valid species. It can be grown for windbreaks and fuel where less hardy Eucalypts do not thrive. The large fruited variety known as variety *macrocarpa* has a pink-flowered form, which should make a handsome garden tree, growing best in sheltered localities.

EUCALYPTS

(Referring to the lid, which is formed of the corolla and calyx-lobes, well covering the organs of reproduction during the early stages of their growth.)

Euc. agglomerata (clustered), Blue-leaf Stringybark.—A fairly large tree, of good shape, on subsided soils in the central subdivision of New South Wales. The tree has a somewhat peppermint-like fragrance. The timber is reddish, or pale brown. It is used largely for weatherboards, fencing and general building purposes.

Euc. bicolor (two-coloured) Black Box.—A medium-sized tree, thirty to forty feet high, with a diameter of two to three feet; is easily destroyed by bush fires, and does not re-establish itself readily by natural regeneration. It is the chief hardwood on the dry northern plains of Victoria for fencing and fuel. The timber is pale red to pale reddish brown, sapwood pale, hard, tough, strong, and very durable. Useful for sleepers, fencing posts, carriage building, furniture and house construction. Also in South Australia, New South Wales, Queensland, and North Australia.

Euc. crebra (frequent), Narrow-leaf Ironbark.—A small, middle-sized, or sometimes a large tree, with a hard, greyish,

rough, persistent bark. Native to New South Wales and Queensland. Wood reddish, hard, heavy, elastic and durable, much used in the construction of bridges and for railway sleepers, also for waggons, piles, fence posts, etc.

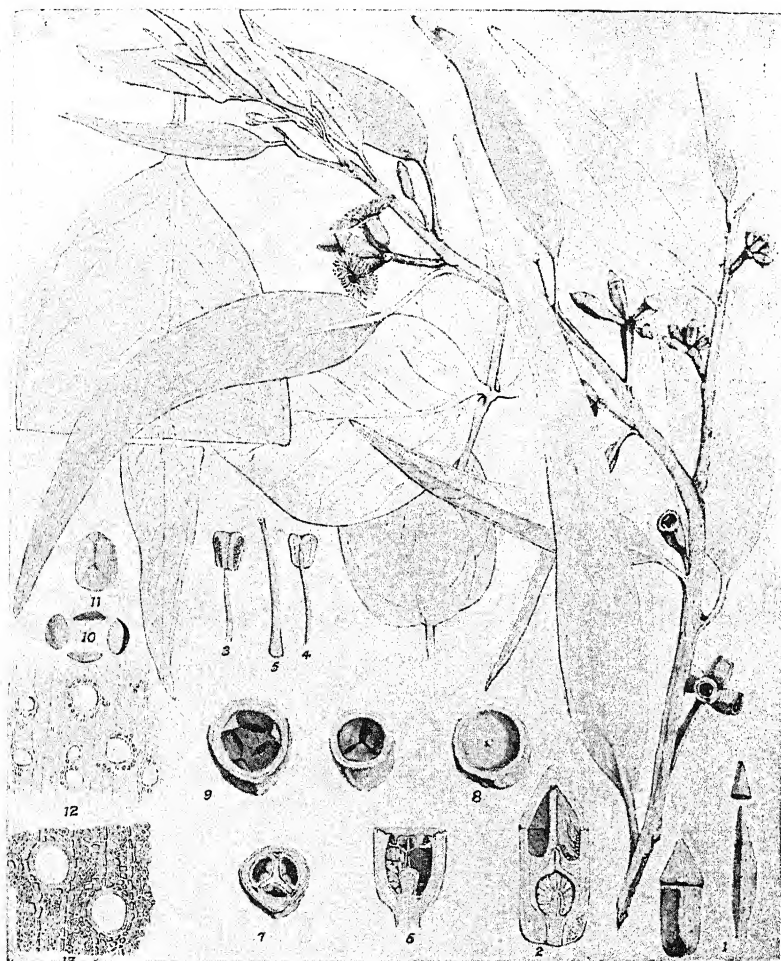
Euc. diversifolia (various-leaved), Sandal Gum. — A medium-sized tree, attaining a height of forty to sixty feet, with smooth bark, and leaves up to three inches long. The wood is too small to be of use for timber, but can be used for turnery, and makes good firewood. Habitat: South-west Victoria, at Cape Nelson, the Mallee, and on the Murray River. Also in South Australia and West Australia, usually near the coast, where it is useful for covering and holding sand dunes in dry districts where sandblows are apt to occur.

Euc. dives (various), Blue Peppermint. — A tree, sometimes attaining a height of 100 feet, with a rough "peppermint" bark, the branches yellowish and smooth, and somewhat ribbony. Leaves two to six inches long. Occurring at the Grampians, Victorian Alps, and near Melbourne, confined to the silurian area. Also in New South Wales. Timber pale, rather tough and hard when dry, fairly durable, and useful for rough work (fence posts, outbuildings). It requires, however, moderately moist conditions. *Euc. drepanophylla* is a closely allied species of similar value, bearing an enormous strain. Both exude astringent gum-resin, resembling kino in appearance and property to a considerable extent.

Euc. exserta (the whole exserted valves), Lagoon Gum. — A moderate-sized tree, the bark ash brown, rough and fissured outside and falling in fragments. Wood a pinkish colour, hard, tough, and durable. Habitat: Rockhampton, and from the Burnett to the Gilbert Rivers, Queensland. Often associated with *Euc. citriodora*. "Lemon-scented Gum."

Euc. ficifolia (fig-like), Red-flowering Gum. — A native of south-western Australia. Although not a tree of large dimensions, this splendid species should be mentioned for the sake of its magnificent trusses of crimson flowers, irrespective of its claims as a shady, heat-resisting avenue tree, not standing in need of watering.

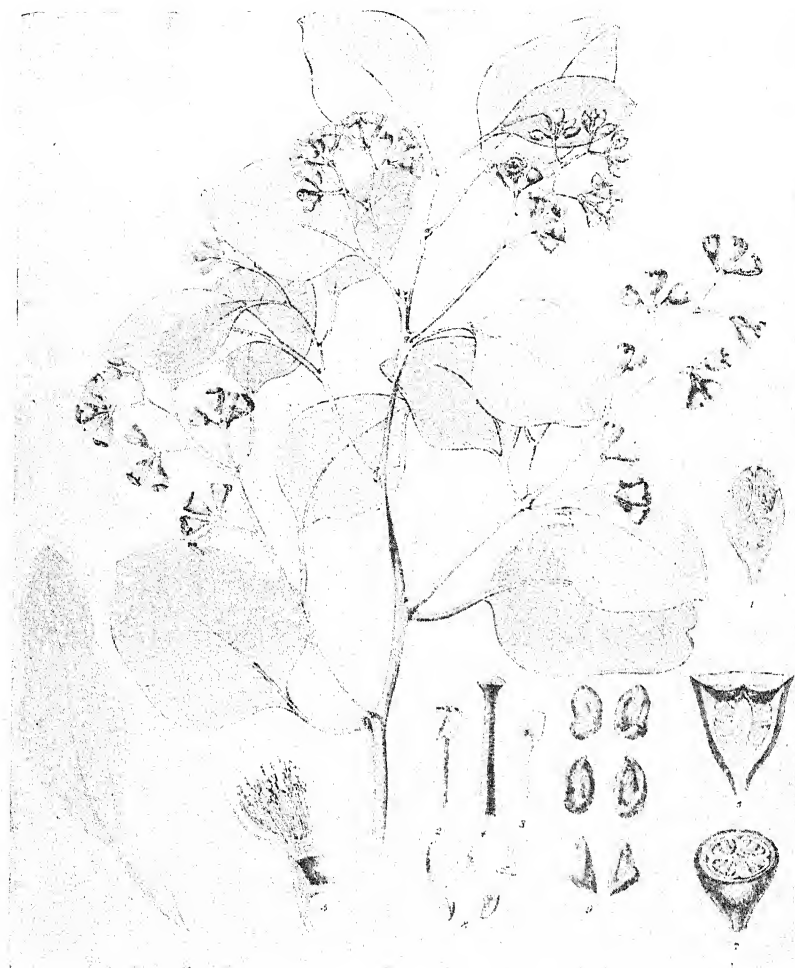
Euc. maculata (spotted trunk), Spotted Gum. — A lofty tree, reaching a height of 150 feet. Grows best on stony ridges. The kino of this species is quite resinous, so much so that articles varnished with it withstand the application of watery fluids. The wood is principally employed in ship-building, wheelwrights' work and coopers' work. The heartwood is as strong as that of British oak. Average specific gravity, when well seasoned, 0.942. Content with poor soil,



MOUNTAIN GUM

(*Eucalyptus goniocalyx*. F.v. M.)

- | | |
|-----------------------------------|---|
| 1. Buds. | 7. Cross section of fruit. |
| 2. Longitudinal section of bud. | 8, 9, 10. Capsules. |
| 3-4. Stamens. | 11. Seed. |
| 5. Stigma. | 12, 13. Portion of leaf showing oil dots. |
| 6. Longitudinal section of fruit. | |



RED BOX

(Eucalyptus polyanthemos, Schauer)

1. Longitudinal section of bud.
- 2 and 3. Stamens.
4. Stigma.
5. Insertion of stamens in flower.

6. Longitudinal section of fruit.
7. Cross section of fruit.
- 8 and 9. Seeds.

but more susceptible to frost than many other congeners. Introduced into Ceylon and Algiers, thrives well on mountains.

Euc. melanophloia (black bark), Silver-leaf Ironbark.—A small, often-crooked-stemmed, spreading-headed tree, with a blackish, persistent deeply furrowed bark, the foliage more or less mealy white. Wood towards the outside greyish, the centre red, close in grain. Habitat: Dawson, Gilbert, and Burnett Rivers, and alluvial flats near Rockhampton, Queensland.

Euc. miniata (vermilion), Powdery Gum. — A fairly large tree, sometimes attaining a height of eighty feet. The branchlets, flowers and fruit, when young, covered with a whitish bloom, the bark fibrous and persistent, but readily separable in flakes. It likes somewhat ferruginous soil. The brilliancy of its orange-coloured flowers, can hardly be surpassed. Habitat: Walsh and Palmer Rivers, Queensland.

Euc. nitens (shining), Shining Gum.—A tall tree, reaching 200 to 300 feet, with a smooth bark, except for a few feet at the base, or rough for the lower third of the trunk. Leaves twelve to eighteen inches long. A native of New South Wales; also eastern Victoria (Baw Baws, Upper Yarra Ranges, Warburton, etc.). Timber: pinkish when fresh, but dries pale or white. Grain straight, fairly close and regular. Useful for building construction, coach building, etc.

Euc. ochrophloia (yellow bark), Yellow Jacket. — A tree usually about forty to fifty feet high, with a rather thick and spongy brownish yellow bark. Wood of a brownish colour, hard, heavy, and close-grained. Habitat: Paroo, Connamulla, and other inland localities in Queensland.

Euc. patens (spreading out), "Black Butt."—The "Black Butt" of South-Western Australia; attains a height of 120 feet. The timber is so tough as not to yield to ordinary splitting processes, therefore useful for various wheelwrights' work. It has been proved useful underground.

Euc. platyphylla (broad-leaved), Broad-leaf Poplar Gum.—A handsome tree, eighty to ninety feet high, with a diameter of four to five feet; the foliage is light green, smooth, white, deciduous bark. Wood red, but not much used. Habitat: Common around Rockhampton, Endeavour River and Broad-sound, Queensland.

Euc. pruinosa (frosty foliage), "Kullingal."—A small tree, with persistent whitish-grey, rough and furrowed bark; the foliage often glaucous or mealy white. Timber qualities

not known: Habitat: Islands of the Gulf of Carpentaria, Queensland.

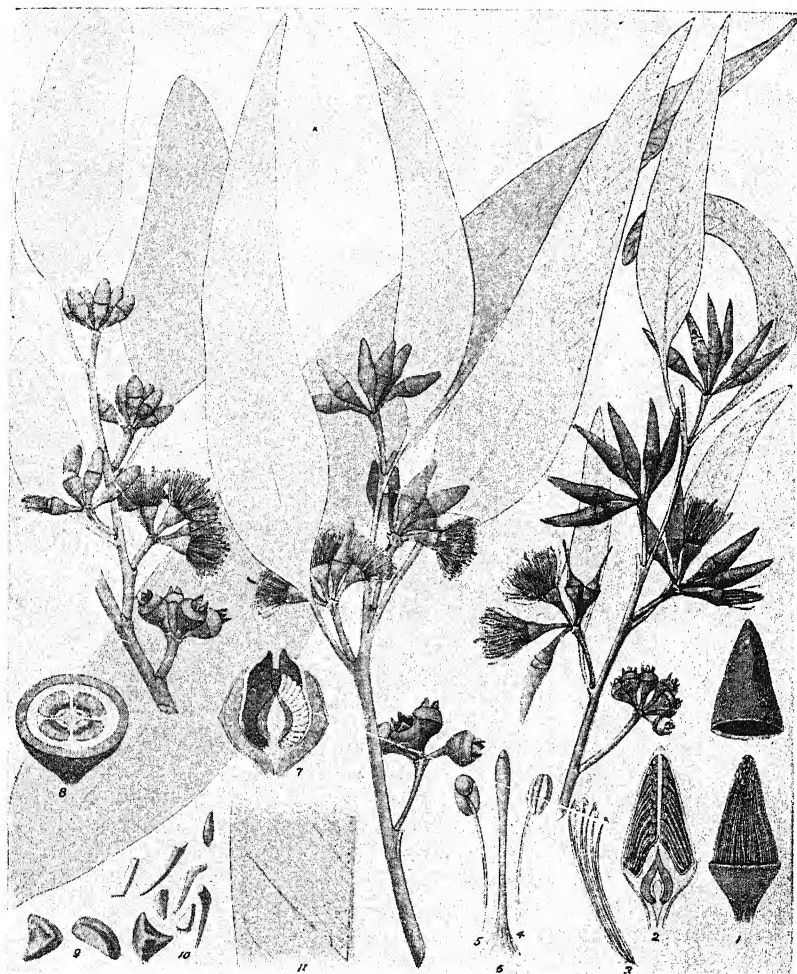
Euc. redunca (fully sufficient), Wandoo. — Usually known as the White Gum Tree of Western Australia, the Wandoo of the aborigines. Attains very large dimensions; stems have been found with a diameter of seventeen feet. The bark is whitish, but not shining, imparting a white coloration when rubbed. The tree is content with poor soil. It furnishes a pale, hard, tough, heavy and durable wood, highly prized for all kinds of wheelwrights' work, and especially for felloes. The seasoned timber weighs about 70 lbs. per cubic foot.

Euc. robusta (robust), Swamp Mahogany.—A moderate-sized tree, with a rough, furrowed bark, bearing a really grand mass of foliage of deep red colour. The wood is remarkably durable, and used for shipbuilding, wheelwrights' work and many implements, such as mallets. This tree seems to thrive well in low, sour, swampy ground, near the sea coast, where other Eucalypts look sickly, but *Euc. robusta* is seen in the picture of health. It is indigenous to New South Wales and southern Queensland. Gum contains 29.5 per cent. tannin, and oil from the dried foliage 7 oz. per cwt.

Euc. salubris (healthy), Gimlet-wood.—The Gimlet-wood or Fluted Gum Tree of south-western Australia occurs on poor, dry soil, along the trans railway route, in company with *Euc. salmonophloia* in the hottest part of the desert region or country. It is usually a slender-stemmed tree, sometimes to 100 feet high, and to two feet in stem diameter. The bark is shining with a brownish tinge, and has broad, longitudinal, and often twisted, impressions, or roundish ridges. The wood is hard and tough, and serves for fence posts and rails, poles and roof supports. For the purpose of xylography it seems well adapted.

Euc. siderphloia (Ironbark), Black Ironbark.—A tall tree, with a hard, persistent bark. Wood of a grey colour, close grained, hard, heavy, and very durable. Useful for large beams in buildings, railway sleepers, and other work where strength and durability are required. Its natural habitat is in the southern portions of Queensland.

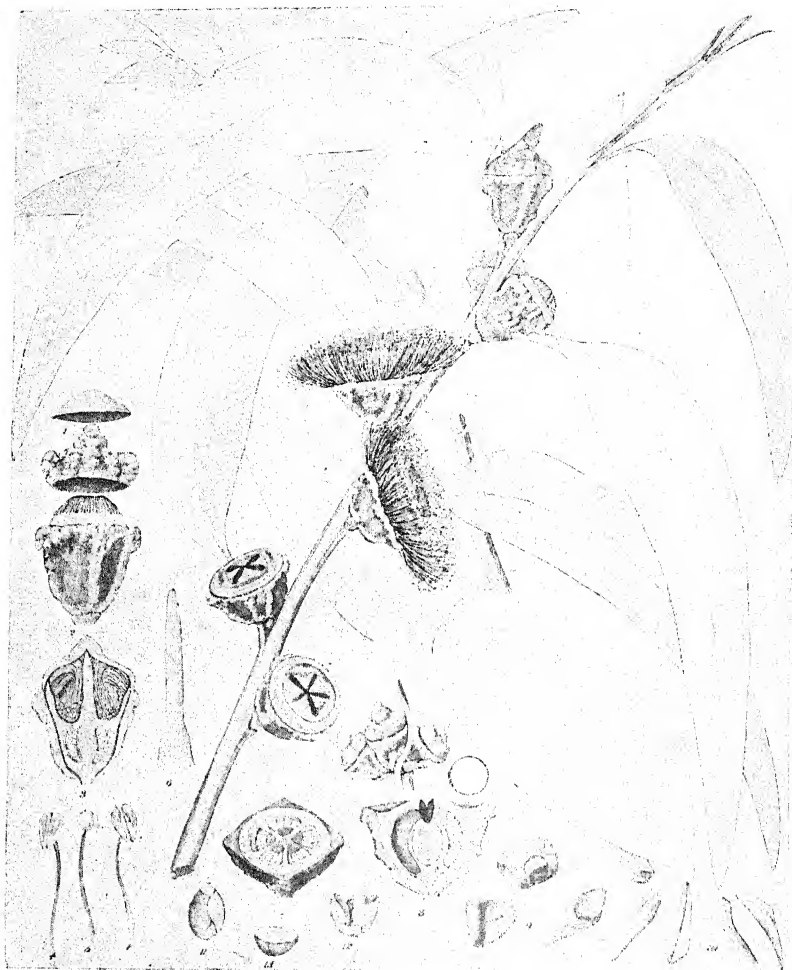
Euc. Smithii (surname Smith), Gully Gum.—A tall tree, 100 to 150 feet high, with a diameter of two to five feet, usually smooth-barked except at the butt, where it is rough, thick and deeply furrowed; above, the bark peels in long strips. Leaves five to six inches long. Indigenous to north-east and east Victoria, at Mallacoota, also in New South Wales. Timber: Pale, close-grained, hard, fairly strong,



FOREST RED GUM

(Eucalyptus tereticornis, Sm.)

- | | |
|---------------------------------|----------------------------|
| 1. Bud, with calyptra. | 8. Cross section of fruit. |
| 2. Longitudinal section of bud. | 9. Seed. |
| 3, 4, 5. Stamens. | 10. Abortive seed. |
| 6. Stigma. | 11. Portion of leaf. |
| 7. Fruit opened. | |



BLUE GUM

(Eucalyptus globulus, Labill.)

- | | |
|-----------------------------------|-----------------------------------|
| 1. Raised operculum. | 9. Seed. |
| 2, 3, 4. Bud sections. | 10. Abortive seed. |
| 5. Stamens. | 11. Embryo in situ. |
| 6. Stigma. | 12. Embryo uncoiled. |
| 7. Cross section of fruit. | 13. Transverse section of embryo. |
| 8. Longitudinal section of fruit. | |

and useful for construction work. A cubic foot weighs 60 lbs. when seasoned.

Euc. Staigeriana (after K. T. Staiger), Lemon-scented Ironbark.—A small tree, with a dark, rugged, irregularly-fissured bark and glaucous foliage. The wood is a rich red, very hard and durable; the stems, however, are often pipey. The foliage and twigs of the tree have the fragrance of lemons, and yield by distillation about 64 oz. from a cwt. of the dry leaves. Habitat: Palmer River, Queensland.

Euc. tessellaris (the lower bark of the stem broken into small squares), "Carbeen."—A large tree, the bark dark brown, smooth and deciduous.

ALBIZZIA

Albizzia basaltica (usually found on basaltic country).—Known as "Dead Finish," and confined to Queensland; the branchlets cylindrical, rusty, with minute, glandular, soft hairs. Pinnæ, one to two pairs, the common petiole half an inch long and very short; leaflets, five to ten pairs, oblong or almost ovate. Peduncles bear a dense round head of about twenty to thirty flowers. Calyx shortly lobed, about two-thirds as long as the corolla. Pod about three inches long, four to five lines broad, very flat and leathery. Seeds flat, orbicular. Its chief habitat is the basaltic plains, Peak Downs, Bowen River, Zamia Creek and Comet River in Queensland. Wood near the bark, bright yellow, heartwood dark red, close grained, and very beautiful. It makes an excellent cabinet wood.

Albizzia procera (lofty), is a fairly tall tree, attaining fifty to sixty feet, with a dense, spreading head. Pinnæ eight pairs, with a short, common petiole; leaflets six to eight, half to one inch long. Peduncles each bear a globular head of fifteen to twenty flowers. Pod five to seven inches long, very flat and thin. Seeds orbicular. It is found only at Thursday Island, but is widely distributed over south-east India and the Archipelago. Wood a dark colour, resembling walnut; a useful cabinet wood.

Albizzia Thozetiana (after M. A. Thozet), occurs at Wide Bay, Fort Cooper, and Rockhampton, Queensland. A medium-sized tree, with a dense, spreading head. Pinnæ, one pair. Peduncles, half to one inch long, in round heads of 20 to 30 flowers. Pod, about eight inches long, very flat and thickened. Wood, a red colour, hard, heavy and durable; very tough, close-grained.

BACKHOUSIA

Backhousia (after James Backhouse).—Calyx-tube turbinate, or broadly campanulate; lobes, four. Petals, four.

Stamens, indefinite, free in several series. Ovary inferior or half superior, two-celled; style, filiform, with a small stigma; capsule enclosed in calyx-tube. Flowers in cymes, on axillary peduncles, often forming terminal, leafy panicles.

Backhousia myrtifolia (Myrtle-leaved).—A slender tree; the leaves more or less pubescent or softly hirsute, ovate, penni-veined, one to two inches long. Flowers white, in small cymes sometimes contracted into heads. Calyx-tube turbinate. Petals, usually five; ovary inferior. Fruit enclosed in calyx-tube. Habitat: Moreton Bay, and Pine River, Queensland. Wood of a light grey colour, darker in the centre; close grained, very hard, and tough; useful for tool handles.

BARRINGTONIA

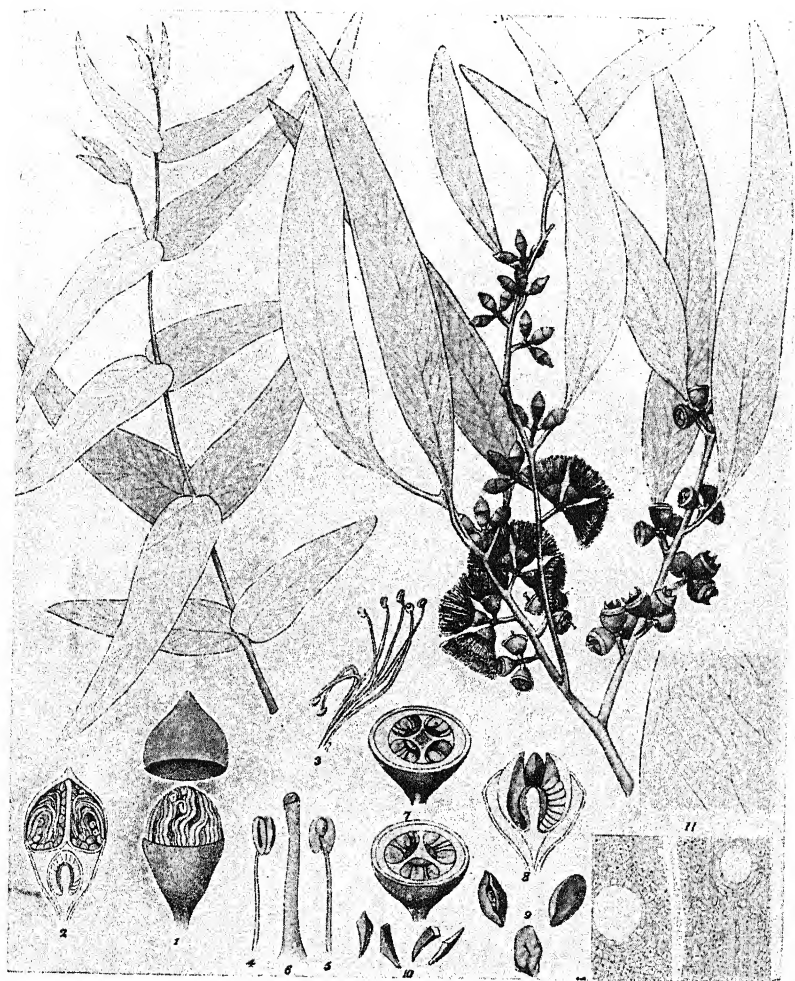
Barringtonia (after the Hon. D. Barrington).—Calyx-tube ovoid or turbinate, the limb splitting into two to four valvate segments. Petals four or five. Stamens numerous. Fruit ovoid or oblong. Seed usually solitary, with a thick testa. Leaves alternate, and crowded at the end of the branches, penni-veined and not dotted. Flowers in terminal or lateral spikes or racemes. Bracts small and deciduous.

Barringtonia racemosa (flowers in long racemes).—A medium-sized tree. Leaves about one foot long and three inches broad, cuneate-oblong, on very short petioles. Flowers in long pendulous racemes, pedicels about half an inch long. Calyx opening into two or four lobes. Petals and stamens white and rosy. Fruit ovoid-oblong, two and a half inches long, one and a half inches broad. Habitat: Rockingham Bay, Mulgrave River, Islands of Torres Straits. Wood of a yellow colour, close-grained, but as it is eaten readily by insects, it becomes of little value.

Barringtonia speciosa (showy).—A large, handsome tree. Leaves sessile, obovate entire, attaining more than one foot in length. Flowers very large, in short, terminal racemes, calyx deeply divided into two or three oval-oblong, leaf-like segments. Petals twice as the calyx segments. Stamens very numerous. Fruit large, four-angled. Habitat: Cape York, Rockingham Bay, Queensland. Wood of a yellow colour, tough, and firm; might be used in cabinet work.

CAREYA

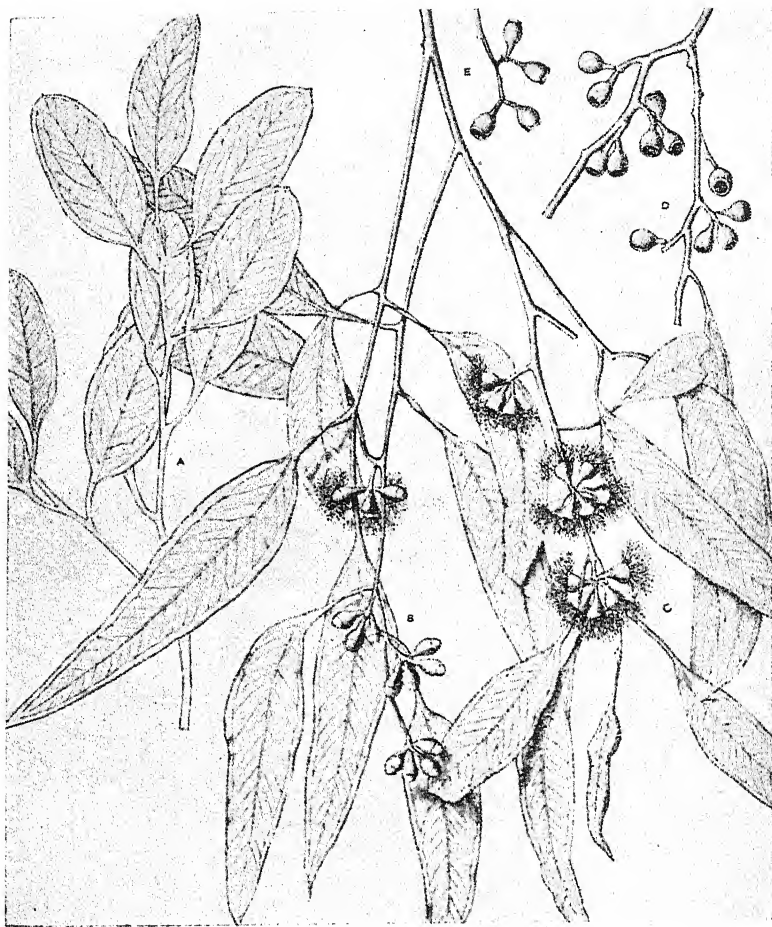
Careya (after Dr. Carey, the divine, and Indian linguist). Calyx tube thick, turbinate or ovoid, the limb deeply four-lobed. Petals, four; stamens numerous; ovary inferior, four or rarely five-celled; fruit globular, fleshy, with a hard rind; seeds several, enveloped in a fleshy pulp. Leaves alternate,



MANNA GUM

(*Eucalyptus viminalis*, Labill.)

- | | |
|-------------------------------|---------------------------------------|
| 1. Bud and calyptra. | 8. Longitudinal section of fruit. |
| 2. Section of flower bud. | 9. Seeds. |
| 3. Stamens. | 10. Abortive seed. |
| 4 and 5. Stamens and anthers. | 11. Portion of leaf showing venation. |
| 6. Stigma. | 12. Portion of leaf showing oil dots. |
| 7. Cross section of fruit. | |



YELLOW GUM

(*Eucalyptus melliodora*, A. Cunn)

A. Young or sucker leaves.
B. Buds.

C. Flowers.
D and E. Fruits.

usually crowded at the ends of the branches, penniveined. Flowers large, in racemes, usually short.

Careya australis (Australian).—Known as "Go-onje," "Gunthamarrah" and "Barror." A tree attaining a large size. Leaves ovate to obovate, and very obtuse. Calyx lobes four, orbicular. Petals in some specimens two inches long. Perfect stamens as long as the petals. Ovary, four-celled. Fruit broadly ovoid, one and a half inches long. Habitat: Cape Grafton, Rockhampton; estuary of the Burdekin River, Queensland. Wood of a light grey colour, red in the centre; close in grain and tough; easily worked. Bark made into twine.

ERYTHRINA (Flowers Red)

Erythrina indica (Indian).—A very large tree in the tropics, usually much smaller in the south, the branches, but not the leaves, armed with prickles, usually black. Leaflets entire, broadly ovate, often six to eight inches long. Flowers scarlet, nearly two inches long, in dense racemes. Calyx broad, one quarter of an inch long, entire or slightly toothed. Standard ovate. Wings and keel nearly similar, all free, and about half an inch long. Pod much contracted between the seeds, often attaining nine inches to one foot. Seeds few, large, red, distinct. Habitat: Islands of the north coast, Port Denison and Tallegatta, Queensland. It flowers in November, and is often planted for shade or ornament. Common in East Indies and the Archipelago. Wood a straw colour, very light and soft, does not seem to be much attacked by insects.

GYROCARPUS

Gyrocarpus (from the wings of the fruit, causing it to twirl in falling from the tree).—Calyx-tube adnate to the ovary, or none in male flowers, limb four to seven-cleft. Petals none. Stamens four to six. Ovary inferior. Drupe dry, crowded by two much-elongated, erect, wing-like, calyx-lobes. Seed oblong.

Gyrocarpus Jacquinii (after N. J. Jacquin).—A tall tree, leaves alternate, broad, entire or lobed. Peduncles in the upper axils, rarely exceeding the petioles, bearing a branched cyme, with densely-crowded, small flowers. Druped ovoid, about three-quarters of an inch long. Habitat: Gilbert River, Port Denison to Rockhampton northward. Wood light and soft.

LYSICARPUS

Lysicarpus (fruits free). — Calyx-tube campanulate, adnate to the ovary at the base; lobes, five, small, almost valvate.

Petals, five; stamens indefinite. Ovary enclosed in calyx-tube, three-celled, with numerous ovules in each cell; style filiform, with a capitate almost three-lobed stigma. Capsule oblong, opening loculicidally in three valves. Flowers in irregular cymes.

The genus is limited to a single species.

Lysicarpus ternifolius (leaves three in each whorl).—A tree attaining about thirty feet, with a soft, thick fibrous bark. Leaves opposite or in whorls of three, narrow-linear, one to three inches long. Calyx tube about one line long. Petals above one line diameter, orbicular. Stamens exceeding the petals. Ovary pubescent. Capsule twice as long as the calyx. Habitat: On the Maranoa, Darling Downs and between the Mackenzie and Dawson Rivers; often found in the ranges or briglow scrubs. Wood light brown, well marked, hard, heavy and elastic; suitable for cabinet work.

MACROPTERANTHES

Macropteranthes (referring to the prominent wings of the calyx). — Calyx-tube produced above the ovary and scarcely contracted. Petals, five; stamens, 10 or fewer; ovules, ten to twelve; style filiform. Leaves opposite or clustered at the nodes, ovate or crowded by the persistent calyx. Flowers in pairs on axillary peduncles. Bracteoles adnate in the centre to the base of the calyx; the margins free, forming wings to the fruiting calyx. The genus is endemic to Australia.

Macropteranthes Fitzalani (after E. Fitzalan).—A tree of moderate size; the tips of the branches silky. Leaves opposite half to one and a half inches long, obcordate on petioles. Peduncles, two, or solitary, bearing one or two flowers. Pedicels very slender, about the length of the calyx. Calyx four to six lines long. Petals almost sessile, ovate-orbicular. Stamens ten to thirteen. Style three lines long. Stigma very minute. Habitat: Port Denison, Gladstone, and Bowen. Wood near the bark yellow, the centre dark grey, close-grained and hard, useful in turnery and cabinet work.

PITHECELLOBIUM. Mart. 1829 (Pithecolobium, from the Greek monkey pod).

Pithecellobium ramiflora (flowers upon the branches).—This species is found near the Daintree River, Queensland. The species is characterised (with other members of the genus) by having bipinnate leaves, flowers clustered in stalked heads, and by the twisted pods when ripe. They make beautiful ornamental trees. The timber is of no commercial importance.

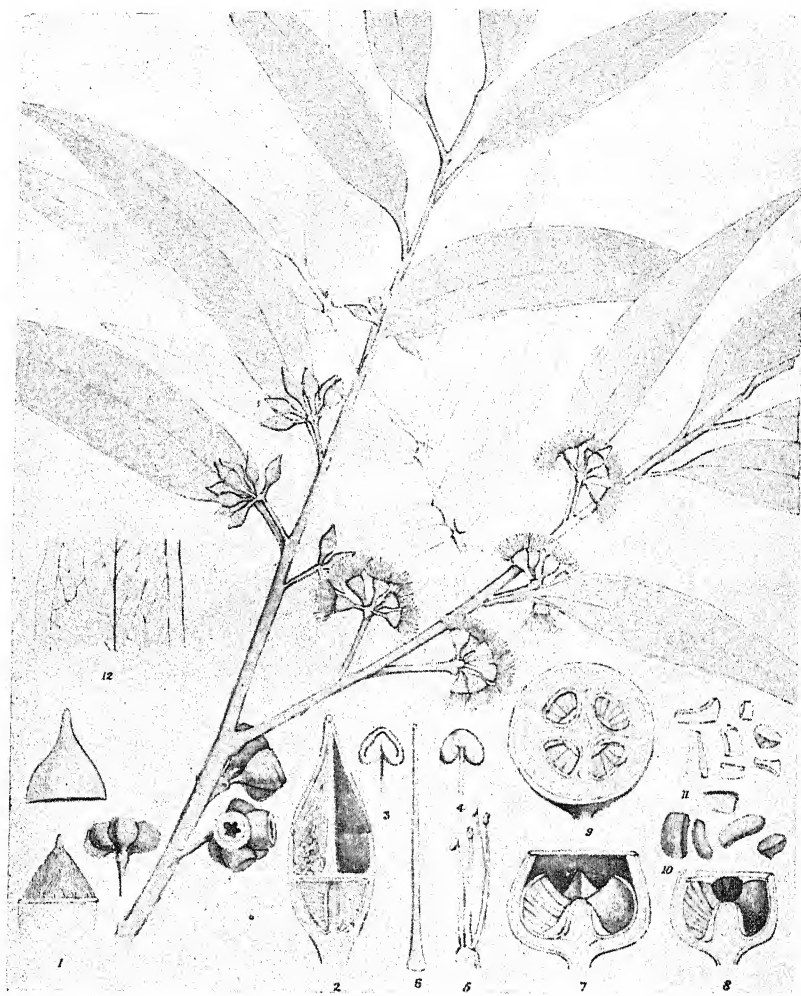


SILVERTOP

(*Eucalyptus Sieberiana*, F.v.M.)

- A. Juvenile leaves.
B. Adult foliage and bud.
C. Young open buds.

- D. Stamens.
E. Fruits.



BLACKBUTT

(*Eucalyptus pilularis*, Sm.)

1. Bud and calyptra.
2. Longitudinal section of bud.
- 3, 4, 5. Stamens.
6. Stigma.
7. Longitudinal section of fruit.

8. Longitudinal section of fruit.
9. Cross section of fruit.
10. Seeds.
11. Abortive seeds.
12. Portion of leaf.

RANDIA (after Isaac Rand)

Randia Audasii—C. T. White (after J. W. Audas). —

"A small glabrous tree, with young branches compressed. Stipules broad ovate 2 mm. long. Leaves shortly petiolate or thickly membraceous when dry, dark brown, ovate lanceolate, obtuse or sub-acute at the base; petiole 5 mm. long, leaf blade ten to thirteen cm. long, 3 to 5 cm. broad; nerves seven to eight sunk into upper side of leaf, somewhat raised underneath. Inflorescence terminal two to four flowered bracts broadly ovate, 2 to 3 mm. long; peduncle 5 to 7 mm. long; pedicels about 1 cm. long; calyx 1 cm. long; limb shortly five-dentate. Corolla creamy white; tube 4 cm. long, glabrous outside, densely pilose inside lobes five, elliptical oblong, 2 to 3 cm. long, 1 to 1.5 cm. broad. Stamens inserted in the throat; filaments 1 mm. long; anthers linear, 1 cm. long. Style glabrous, very much thickened, bilamellate. Habitat: Moubray River, altitude 1,000 ft., on rain-forest borders, and Endeavour River. This is evidently a striking plant in the field; it does not show marked affinities with any previously recorded Australian species. I take this opportunity of dedicating this plant to Mr. James W. Audas, Curator of the National Herbarium, Melbourne, who has rendered me valuable assistance in my studies on North Queensland plants."

RHODAMNIA (Rose-like)

Rhodamnia sessiliflora (flowers stalkless), "Koorkabidgan."—A medium-sized tree. Leaves acuminate, mostly above three inches long. Flowers sessile in the axis. Bracteoles small, linear. Calyx densely hairy, about one line long. Petals one and a half line diameter. Stamens rather longer. Berry small, globular. Habitat: Rockingham Bay, Queensland. Wood of a dark colour, close-grained, and tough.

RHODOMYRTUS (rose myrtles)

Rhodomyrtus trineura (leaves three-nerved).—A small tree, the young shoots more or less velvety tomentose. Leaves ovate-lanceolate, one to two inches long. Flowers usually three together, sessile in the axis, or borne on a short, common peduncle. Petals minutely pubescent or glabrous. Berry globular. Habitat: Gould Island, wooded shores of Rockingham Bay, and Bellenden Ker Ranges, Queensland.

TERMINALIA (leaves usually at the end of the branches)

Terminalia bursarina (resembling a Bursaria).—A small tree, the young branches and foliage softly silky-pubescent. Leaves crowded, narrow-oblong or lanceolate, about one to two inches long. Spikes pedunculate, dense, exceeding the leaves, and three to four inches long, the rhachis and flowers softly silky. Calyx-tube one line long. Drupe three-angled, and furnished in the centre with a prominent blunt spur. Habitat: Gulf of Carpentaria, and Gulf country. Wood dark coloured, close grained, hard and prettily marked.

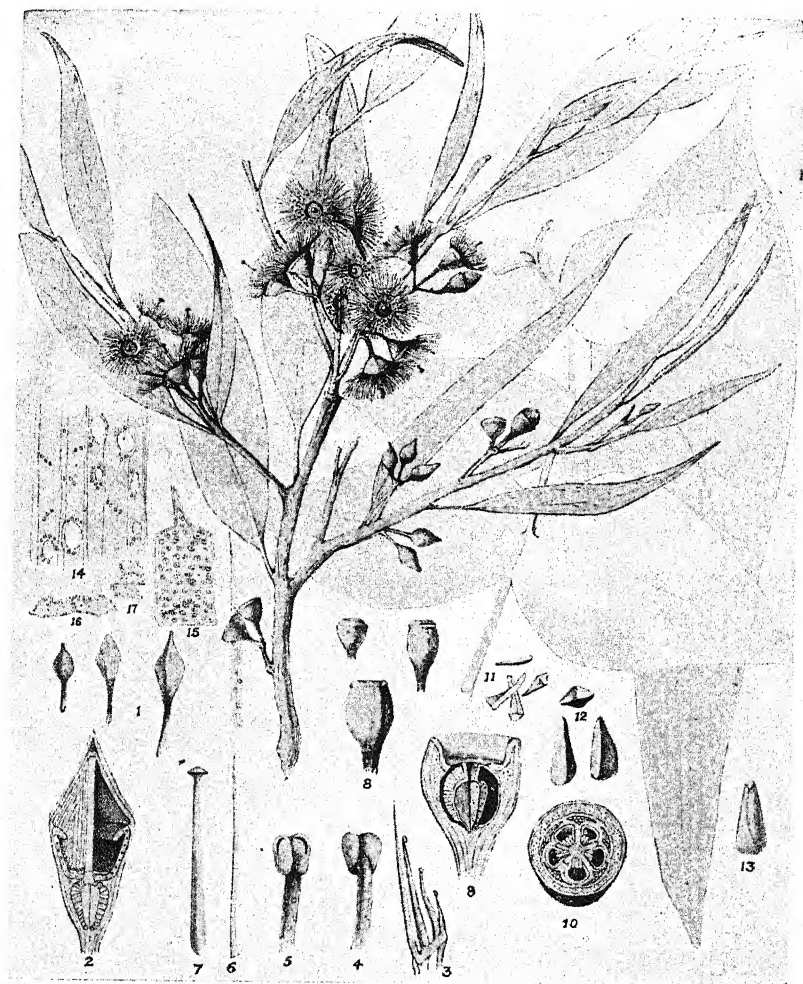
Terminalia melanocarpa (black fruit). — A glabrous, medium-sized tree. Leaves obtusely acuminate, three to six inches long. Spikes loose, about as long as the leaves, the rhachis nearly glabrous. Flowers numerous, but not crowded. Stamens and style glabrous. Drupe about one inch long, and ovoid. Habitat: Port Denison and Edgecombe Bay, and many other localities in the tropics. Wood of a light yellow colour, close grained, hard and tough.

Terminalia platyphylla (broad leaved).—A moderate-sized tree. Leaves obovate or obtuse, four to six inches long. Spikes usually shorter than the leaves, with numerous small flowers, loose or crowded. Calyx somewhat viscid. Drupe ovoid or oblong, not winged. Habitat: Islands of the Gulf of Carpentaria, Flinders River, and Thursday Island. Wood a dark colour, close in grain, tough, hard, and prettily marked.

Terminalia platyptera (broad winged).—A small tree, the young branches almost velvety. Leaves crowded at the end of the flowering branches, obovate, very obtuse, one and a half to two and a half inches long, the reticulate veins prominent. Spikes densely pubescent. Calyx softly tomentose inside and out. Style hairy. Fruit two winged, about one inch long. Habitat: Etherridge and Palmer Rivers, Queensland. Wood of a light yellow colour, close grained and hard.

TRISTANIA (after Charles Tristan, a French botanist)

Tristania longivalvis (valves of fruit long).—A tree of small size, with drooping branchlets. It is known as Buttercup Tree. The leaves on very short petioles, and obovate, attain a length of about four inches, with a breadth of two inches, are finely penninerved and thinly net-veined. Cymes axillary, very thickened upwards. Petals orbicular, yellow, about four lines wide. Stamens shorter than the petals, numerous in each fascicle. Style eight lines long; stigma scarcely dilated. Fruit about six lines long, and hard. Habitat: Prince of Wales Island, Cape York. Wood of a straw colour.

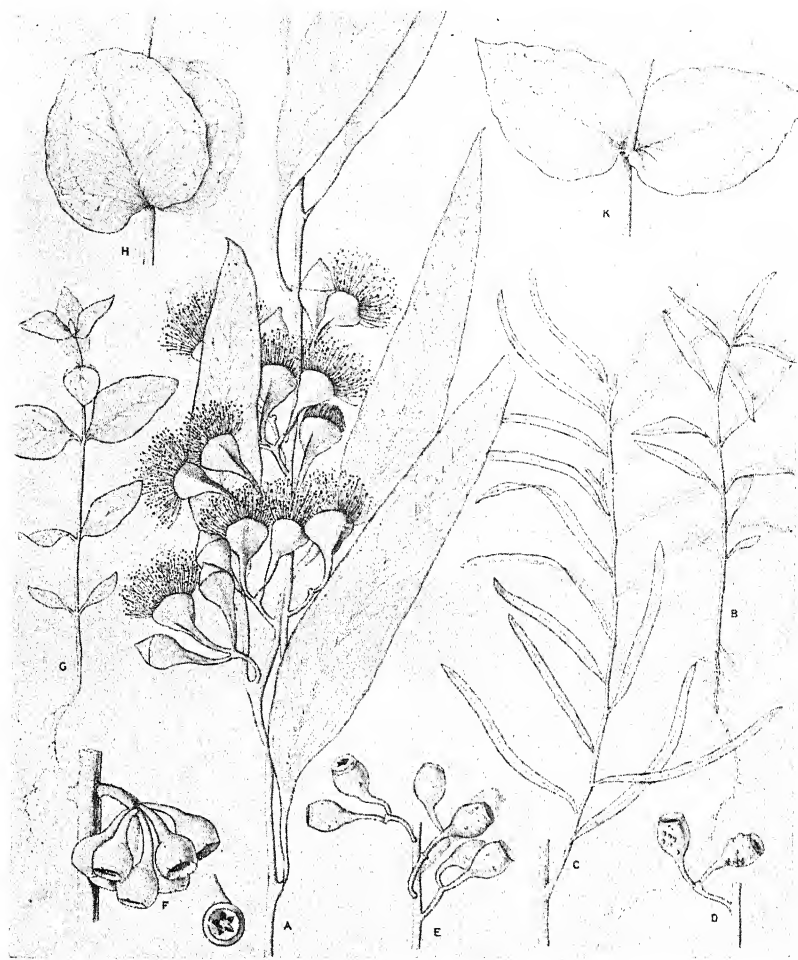


YELLOW GUM

(*Eucalyptus leucoxylon*, F.v.M.)

1. Buds.
2. Longitudinal section of bud.
- 3, 4, 5. Stamens.
6. Sterile stamen.
7. Stigma and style.
8. Fruit.
9. Longitudinal section of fruit.

10. Cross section of fruit.
11. Abortive seed.
- 12, 13. Seeds.
14. Transverse section of wood.
15. Vascular tube.
16. Parenchymatous particles.
17. Parenchymatous particles.



RED IRONBARK

(*Eucalyptus Sideroxylon*, A. Cunn.)

The following are *Eucalyptus leucoxylon* F.v.M. for comparison:—

- | | |
|---|------------------------|
| A. An original specimen in flower, collected by Allan Cunningham. | D, E, F. Fruits. |
| B. Seedling raised from seed. | G. Seedling. |
| C. Natural seedling. | H, K. Juvenile leaves. |

close-grained, very hard and tough, stands well in drying, and should prove valuable for building purposes.

EUCALYPTUS OILS

The numerous types of Eucalyptus oils find their uses in many ways, and new employments for them are being discovered. The steady attention and outlook for the future utilisation of these oils in new branches of manufacture is most promising. The following are a few extracts taken from Baker and Smith's work, "A Research on Eucalypts and Their Essential Oils."

It is not generally known, however, that among the first natural raw products from Australia was Eucalyptus oil. In the "Journal of a Voyage to New South Wales," by John White, Surgeon-General to the Settlement, and published in London in 1790, is this statement in the appendix, p. 227: "The name of 'Peppermint Tree' has been given to this plant by Mr. White, on account of the very great resemblance between the essential oil drawn from the leaves and that obtained from the 'Peppermint' (*Mentha piperita*), which grows in England. This oil was found by Mr. White to be much more efficacious in removing all cholicky complaints than that of the English 'Peppermint,' which he attributes to its being less pungent and more aromatic."

The above, written by Dr. J. E. Smith, chiefly shows that the credit of being the first to produce and use Eucalyptus oil therapeutically was Surgeon-General White, and to him thus belongs the honour of founding the Eucalyptus industry.

For Pharmaceutical Purposes

The species from which the first sample of Eucalyptus oil had been distilled was (*Euc. piperita*), and this Eucalypt gives a product consisting of phellandrene, piperitone, cineol and some other constituents.

It might be as well to mention that the Eucalyptus oil industry was established in Australia on oils of this class. In 1854 the late Mr. Joseph Bosisto founded, in Richmond, Victoria, the first factory for the commercial distillation of Eucalyptus oil in Australia, the species utilised being chiefly the one known at that time as *Euc. amygdalina*. The oil of that species contained phellandrene, piperitone and cineol, and in constitution had some resemblance to that of *Euc. piperita*.

As the more strongly marked cineol-bearing Eucalyptus oils became in urgent demand, those containing phellandrene

receded in favour, and to meet this demand the "Mallee" oils came into full relief, while in Tasmania the chief species employed was *Euc. globulus*. The "Mallee" oils are allied by nature to the "Boxes," and contain, in many cases, some distinguishing qualities from those of *Euc. globulus* type, in that they contain aldehyde aromadendral, a principle with five or six times the bactericidal value of cineol.

The demand at the present time for medicinal oils is mostly for those having a high cineol content, of that component; but only a comparatively few species yield oils of this character in sufficient amount to be profitable for distilling at the usual price paid for cineol oils, and for that reason the demand for those containing 70 to 80 per cent of cineol has far exceeded the supply.

A very important use to which the phellandrene-piperitone Eucalyptus oils are put is in the separation of metallic sulphides from the gangue, by a flotation process carried out at Broken Hill, New South Wales. Less than a pound of this reagent is all that is required to recover the values from a ton of ore.

Since that time very large amounts of oil have been distilled from the "Peppermint" species, both in Victoria and New South Wales, and used for flotation work. *Euc. dives*, the "Broad-leaf Peppermint," is usually recognised as yielding the best oil for this purpose, and therefore the product of this Eucalypt is in much demand.

This species, together with the Narrow-leaf Peppermint (*Euc. phellandra*), has an extensive range in the States already mentioned, and is especially abundant at certain localities in the mountain ranges at altitudes of about 1,000 to 2,000 feet. As the oil from this particular species is such a useful article of commerce, and contains piperitone in quantity, it should be good policy to conserve the species, *Euc. dives*, for oil production, in those localities where it is to be found spreading over large areas in abundance. This species of Eucalypt grows on the poorest of soil and in mountainous country, not likely to be in much demand for agricultural or other purposes.

Perfumery Purposes

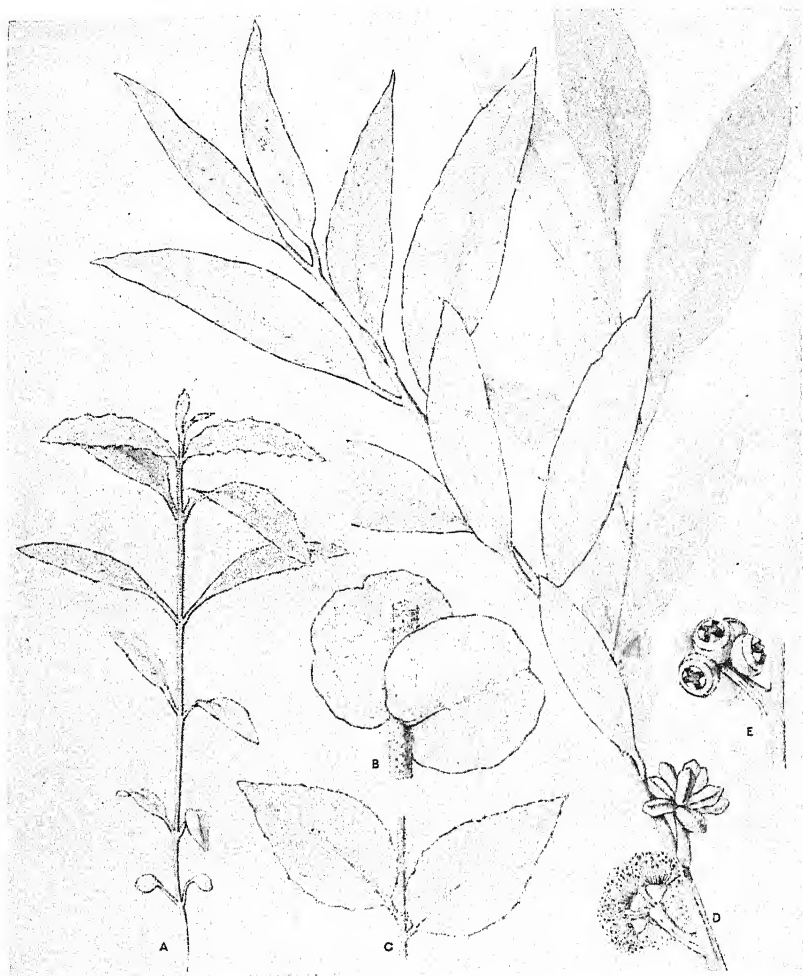
An important direction in which certain Eucalypt oils are now used is in the perfumery industry, for scenting soaps, and similar purposes. A frequent occurring constituent in Eucalyptus oils is the acetic acid ester of geraniol. Like all other constituents occurring in Eucalyptus oils, geranyl-acetate reaches a maximum in one species, viz., *Euc. Macarthurii*, where it is found on both the leaves and the bark.



YELLOW STRINGYBARK
 (*Eucalyptus Muellieriana*, Howitt)

1 Seedling.
 2. Flowering twig.

3. Twig bearing fruits.



BROWN STRINGYBARK
(*Eusalyptus capitellata*, Sm.)

A. Seedling.
B, C. Sucker leaves.

D. Flowering branch.
E. Fruits.

The lemon-scented gum (*Euc. citriodora*), a species which yields an oil consisting almost entirely of aldehyde citronellal. This oil is in considerable request for perfumery purposes, and is used for the production of the corresponding alcohol, citronellol, which substance has an even more pronounced rose odour than the geraniol.

Additional odoriferous constituents are the ketone piperitone, a commonly occurring substance in the oils of the "Peppermints"; and the aldehyde aromadendral which is present in those of the typical "Boxes" and associated "Gums." The former constituent is found in quantity in the oil of *Euc. dives* and other species, and the latter in those of *Euc. hemiphloia*, *Euc. rostrata*, and oils of that class.

The oil of the Narrow-leaf Peppermint (*Euc. australiana*) should be of value for perfumery purposes, as it contains terpineol and geraniol, as well as esters. Terpineol, like geraniol, is a common constituent in Eucalyptus oils.

Other Uses

Besides those already enumerated, the various Eucalyptus oils are utilised in other directions, and find uses in the manufacture of a large number of useful articles, as well as in the soap-making industry, the preparation of disinfectants, and as solvents. The ash of leaves has manurial value, and contains a good percentage of potash and phosphoric acid.

The oils of different species vary considerably in quantity and in value. Some of the Eucalypts, with a high percentage of oil, are large trees, and involve a considerable amount of labour and a greater amount of waste than some of the "Mallee" species, the foliage of which is easy to collect, and the oil, though not present in the highest percentages, is of finer quality.

Leaf Material for Oil Distillation—from Native Eucalypts

The most profitable species of Eucalypts for oil production (considered from a commercial viewpoint) are those which, both for yields and quantity of oil, can stand the test of sufficient rivalry, so that naturally the continuity of supply comes into the question, more so when a permanent plant has been erected.

In virgin forest country where the growth of Eucalyptus species has had free will, many of them, useful for oil production, attain large or definite extent of bulk, especially species like *Euc. globulus*, *Euc. regnans*, *Euc. pilularis*, *Euc. dealbata*, *Euc. citriodora*, etc. As only the leaves and terminal branches are required by the distiller, such

large trees are naturally unprofitable, the material having to be collected either by lopping off the branches or by felling the trees.

Opinion or the judgment of the worth is divided as to which of the two methods is the most profitable, and at one time considerable lopping of the branches from big trees was carried out. Lopping, however, is dangerous, and men are opposed to climbing tall trees for the purpose.

More easy collection would be obtained from the "cop-pice" growth which springs from short remaining stems of the felled trees, and with many species this is quickly fully sufficiently produced.

BEE CULTURE

Victorian Eucalypts and Their Honey Value

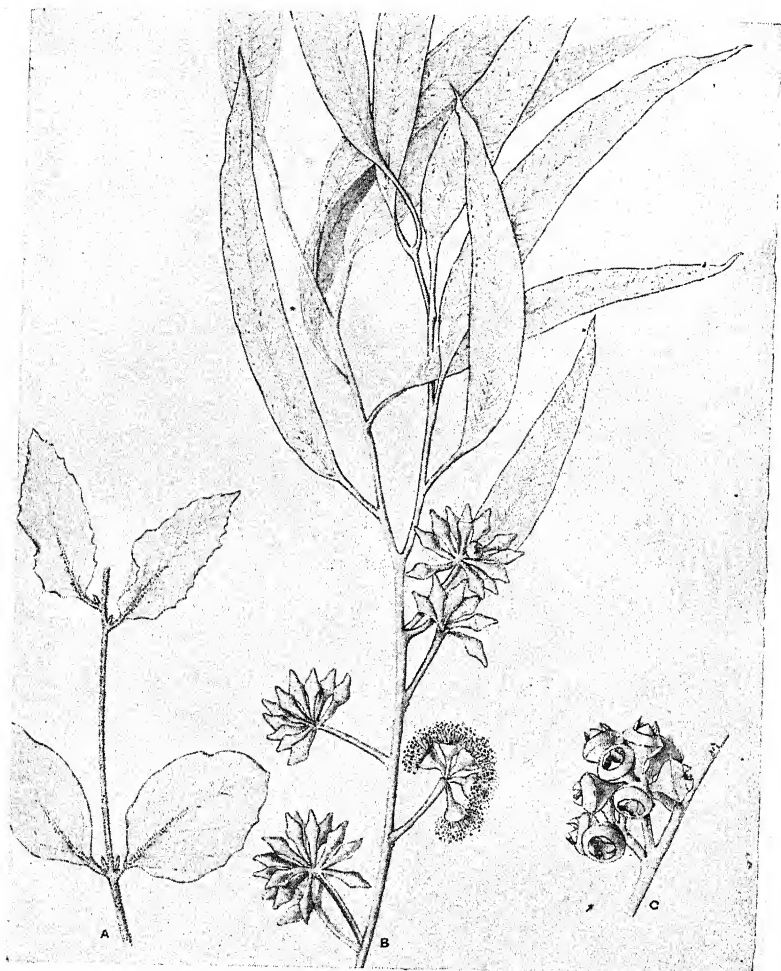
Three factors govern success in bee culture, namely, locality, management, and the right strain of bees. Of these three, the first-named is the most important, for, without suitable locality, the best management and the best strain of bees cannot produce good results, while, even with poor management and an inferior strain of bees, fairly good results are sometimes obtained in good honey districts.

It is somewhat hard to describe the various species of Eucalypts in a way which would enable the reader to distinguish one from another by the means of the illustrations here produced, the technical terms are, as far as possible, avoided. However, for identification, the reader is requested to rely mainly on a comparison of the shape of the veins of the leaves, the shape and number in one cluster of the buds, flowers, and seed vessels, and the semblance of the sucker leaves (where shown). The illustrations are reproduced from Forest Flora of New South Wales, by the late Mr. J. H. Maiden, and from the late Baron von Mueller's "Eucalypts of Australia." The annotations I quote are taken from "The Honey Flora of Victoria," compiled by the Department of Agriculture.

In the list compiled of Eucalypts given beneath the species are arranged in seven groups, according to their general and familiar forest appearance.

As, however, there is no clear line of demarkation between the different groups, and well-established popular names have to some extent had to be taken into account, some species could be placed into one or other of the groups:—

I. Box Group.—Trees with a persistent bark covering the trunk and in some species the limbs (10 species).



RED STRINGYBARK
(*Eucalyptus macrorrhyncha*, F.v.M.)

A. Juvenile leaves.
B. Flowering branch.

C. Fruits.



MESSMATE STRINGYBARK
(*Eucalyptus obliqua*, L'herit.)

A. Leaf in the intermediate stage.
B. Twig showing buds and flowers.

C. Fruits.

II. Gum Group.—Trunk with smooth ribbony bark, which is shed periodically, limbs and branches smooth (22 species).

III. Stringybarks.—Trunk and branches covered with a fibrous, persistent bark (10 species).

IV. Ironbarks.—Trunk covered with harsh bark (3 species).

V. Wrinkled Barks.—Trees covered with a crinkled scaly bark (4 species).

VI. Peppermints.—Trees covered with a box-like but more fibrous and generally greyish bark (4 species).

VII. Mallees or Dwarf Eucalypts (9 species).

Note.—In the table the common names are those adopted by the Plant Names Committee of the Field Naturalists' Club. The regions in which the species occur are given in the geographic indications of Baron von Mueller's "Key to the Victorian Plants," as follows:—

N.W., the north-western region; the sources of the water-courses in the north-west to the Murray River.

S.W., the south-western region; the sources of the water-courses in the south-west to the coast west of Cape Otway and to the vicinity of the Glenelg River.

S., the southern region, from the sources of the water-courses in the south to the vicinity of Cape Otway to Port Phillip and to the western boundary of Gippsland.

N.E., the north-eastern region; from the sources of water-courses in the north-east to the Hume River, including the whole of the Victorian Alps.

E., the eastern region, comprising Gippsland, exclusive of the Alps.

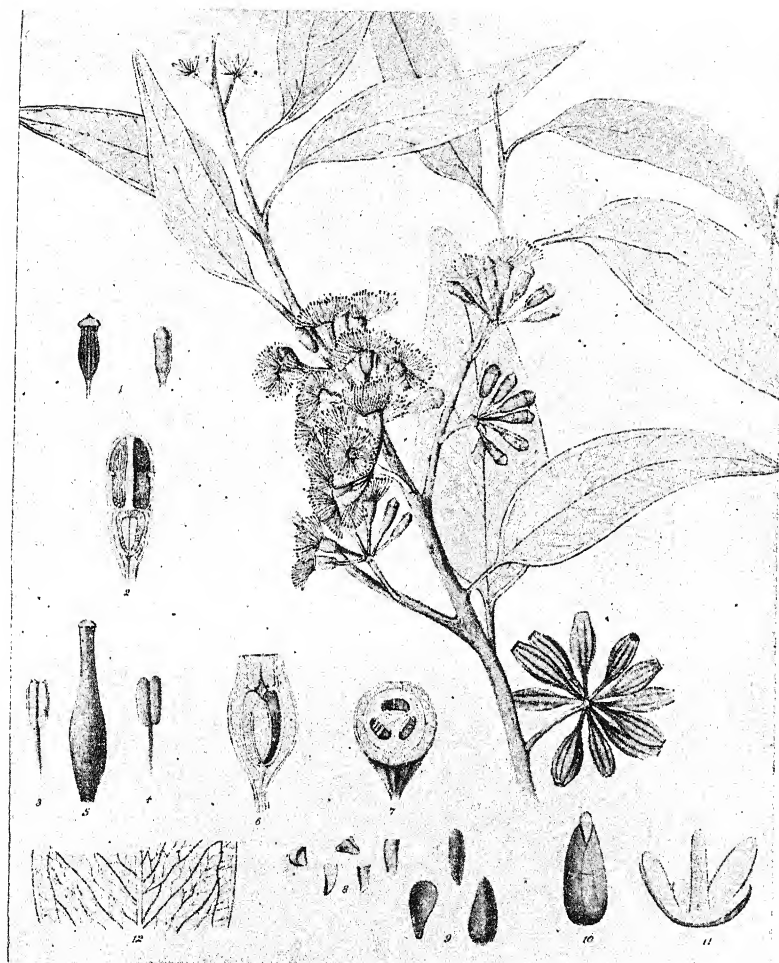
Where a species is common to all districts the word "all" is used.



GREY BOX

(Eucalyptus hemiphloia, F.v.M.)

A. Twig of fruits of the typical form. B. Section of fruit of variety *albens*.



SUGAR GUM

(*Eucalyptus cladocalyx*, F.v.M.)

- | | |
|-----------------------------------|----------------------|
| 1. Buds. | 8. Abortive seed. |
| 2. Longitudinal section of buds. | 9. Seeds. |
| 3, 4. Stamens. | 10. Embryo. |
| 5. Stigma. | 11. Embryo unfolded. |
| 6. Longitudinal section of fruit. | 12. Section of leaf. |
| 7. Cross section of fruit. | |



WHITE STRINGYBARK
(*Eucalyptus eugenioides*, Sieb.)

A. Juvenile leaf.
B. Adult foliage and bud.

C. Young open buds.
D. Fruits.

Vernacular Name	Specific Name	Honey Pollen	Districts	Oil % lbs. ozs. per 1,000 lbs. of foliage.
Group I.—				
Box Trees				
Yellow Box	<i>Euc. melliodora</i> . . .	H.	All	6 12
Grey Box	<i>Euc. hemiphloia</i> . . .	H.P.	N.W., S.	5 9
Red Box	<i>Euc. polyanthemosa</i> . .	H.	All	8 6
Fuzzy Box	<i>Euc. Baueriana</i> . . .	H.P.	E.	
Long-leaf Box . . .	<i>Euc. elaeophora</i> . . .	H.P.	All	7 5
Black Box	<i>Euc. bicolor</i>	H.P.	N.W.	5 3
Gippsland Box . . .	<i>Euc. Bosistoana</i> . . .	H.	E.	9 11
Scented Box	<i>Euc. odorata</i>	H.	N.W.	6 6
Apple Box	<i>Euc. Stuartiana</i> . . .	H.P.	S.W., S.	4 3
But But	<i>Euc. Bridqesiana</i> . . .	H.	N.E., E.	6 3
II.—Smooth Bark or				
Gum Group				
River Red Gum . . .	<i>Euc. rostrata</i>	H.P.	All	3 0
Forest Red Gum . .	<i>Euc. tereticornis</i> . . .	H.P.	N.E., E.	4 13
Yellow Gum	<i>Euc. leucoxylon</i> . . .	H.	N.W., S.W.	
			S.	
Sugar Gum	<i>Euc. cladocalyx</i> . . .	H.P.	N.W.	
Blue Gum	<i>Euc. globulus</i>	H.P.	S., N.E., E.	7 7
Spotted Blue Gum . .	<i>Euc. Maidenii</i>	H.P.	S.W., E.	13 1
Manna Gum	<i>Euc. viminalis</i>	H.P.	All	3 9
Candle Bark	<i>Euc. rubida</i>	H.P.	All	0 1
Gully Gum	<i>Euc. Smithii</i>	H.P.	E.	14 5
White Brittle Gum .	<i>Euc. maculosa</i>		E.	8 7
Swamp Gum	<i>Euc. ovata</i>	H.P.	S.W., S.	2 0
			N.E., E.	
Cider Gum	<i>Euc. Gunnii</i>	H.P.	S.E.	2 0
Dwarf Gum	<i>Euc. Kitsoniana</i> . . .		E.	
Sallow Gum	<i>Euc. camphora</i>	H.P.	N.E.	8 6
Spotted Gum	<i>Euc. maculata</i>		E.	1 11
Shining Gum	<i>Euc. nitens</i>	H.P.	E.	
Mountain Grey Box .	<i>Euc. goniocalyx</i> . . .	H.P.	S.W., S.	
White Sallee	<i>Euc. coriacea</i>	H.P.	S., N.E., E.	
Snow Gum	<i>Euc. coriaces, var.</i>			
	<i>alpina</i>	H.P.	N.E.	
Black Sallee	<i>Euc. stellulata</i> . . .		N.E.	2 15
Scribbly Gum	<i>Euc. haemastoma</i> . . .		N.E., E.	2 7
Sandal Gum	<i>Euc. diversifolia</i> . . .	H.	S.W.	
III.—Stringybark				
Group.				
Messmate Stringy-				
bark	<i>Euc. obliqua</i>	H.P.	N.E., E.,	
Red Stringybark . .	<i>Euc. macrorrhyncha</i> . .	H.P.	S.W., S.	6 12
Brown Stringybark .	<i>Euc. capitellata</i> . . .	H.P.	S., N.E., E.	2 12
White Stringybark .	<i>Euc. eugenioides</i> . . .	H.P.	All	1 0
Yellow Stringybark .	<i>Euc. Muelleriana</i> . . .	H.P.	N.E., E.	7 7
Yertchuk	<i>Euc. Consideniana</i> . .		E.	
Mealy Stringybark .	<i>Euc. cinerea</i>		E., S.	
Silver Stringybark .	<i>Euc. cinerea Var.</i>		N., E.	11 14
	<i>multiflora</i>	H.P.	N.E., S. E.	
Red Mountain Ash .	<i>Euc. gigantea</i>		S., E.	17 10
Grampians Gum . . .	<i>Euc. alpina</i>		S.W.	

Vernacular Name	Specific Name	Honey Pollen	Districts	Oil %, lbs. ozs. per 1,000 lbs. of foliage.
IV.—Ironbark Group.				
Red Ironbark	<i>Euc. Sideroxylon</i> . . .	H.	N.W., N.E., E.	5 6
Grey Ironbark . . .	<i>Euc. paniculata</i> . .		E.	0 14
Silvertop	<i>Euc. Sieberiana</i> . .	H.P.	N., S. E.	4 3
V.—Wrinkled Bark Group				
Mahogany Gum . . .	<i>Euc. botyroides</i> . . .	H.P.	E.	0 14
Bloodwood	<i>Euc. gummifera</i> . . .	H.	E.	5 6
Black Butt	<i>Euc. pilularis</i> . . .		E.	1 5
Woolly Butt	<i>Euc. longifolia</i> . . .	H.	E.	
VI.—Peppermint Group				
White Mountain Ash	<i>Euc. regnans</i>		S., N.E., E.	
Peppermint Stringybark	<i>Euc. piperita</i>		E.	6 4
Whitetop Gum	<i>Euc. vitrea</i>	H.P.	E.	14 13
River White Gum . . .	<i>Euc. radiata</i>		E.	16 7
VII.—Mallee Group				
Bull Mallee	<i>Euc. Behriana</i>		N.W., S.	6 2
Hooked Mallee	<i>Euc. uncinata</i>	H.P.	N.W.	4 5
Slender Mallee	<i>Euc. calycogona</i> . . .		N.W.	9 0
Oil Mallee	<i>Euc. oleosa</i>		N.W.	9 11
Giant Mallee	<i>Euc. incrassata</i> . . .	H.P.	N.W.	8 12
Angular Mallee	<i>Euc. incrassata</i> . . .			
	<i>Var. angulosa</i>	H.P.	N.W.	8 14
White Mallee	<i>Euc. dumosa</i>	H.	N.W.	10 0
Blue Mallee	<i>Euc. polybractea</i> . .		N.W.	13 6
Green Mallee	<i>Euc. viridis</i>		N.W.	10 10

THE WATTLES, OR ACACIAS

These Australian trees are also well known in some other parts of the world, especially South Africa. Out of 800 species known to science, about six hundred are indigenous to Australia. Allied by nature to the Mimosas of America, the Australian species are called "Wattles." The prevalence of the genus throughout the continent, characterized almost everywhere by profuse blooms, pleasing to the senses in colour and scent, has made the wattle the national emblem, a sentiment has grown up around it, and "Wattle Day" (q.v.) is an established anniversary in many centres of population.

The species vary considerably in size, from prostrate or matted forms a few inches high, to shrubs and small trees; a

few species attain the dignity of forest trees. Many flower in the early spring, and are very suitable as ornamental shrubs for parks and gardens. They are not, as a rule, suitable for street planting, being short-lived, and often subject to the attacks of boring insects.

Their cultivation is not difficult, though the hard nature of the seed-coat makes it necessary to assist germination by putting the seeds in water that has boiled, and leaving them there several hours. Under natural conditions germination is accelerated by bush fires, after which the seedlings spring up in profusion. The Wattles are valuable agents in soil fertilisation, as they have the power of assimilating nitrogen by the activities of bacteria located in tubercles formed on their roots. They also yield a great quantity of honey at a time when other flowers are not plentiful. Several species are stripped for their bark, which is always in great demand for tanning. The species most valued for this purpose are *Ac. decurrens* (Black Wattle), *Ac. pycnantha* (Golden Wattle) and *Ac. dealbata* (Silver Wattle). Among other species which are stripped for their bark, are *Ac. falciformis* (Mountain Hickory), *Ac. binervata* (two-veined Hickory) and *Ac. leio-phylla* (Weeping Wattle).

The bark of all Wattles is more or less astringent, and is used in domestic medicine as a decoction or infusion in cases of diarrhœa, dysentery, etc. Saponin is present in the bark of *Ac. anthelminthica*; in the fruit of *Ac. concinna*; in the leaves of *Ac. pulchella*; and in the seeds of *Ac. verticilla* (Prickly Moses). Other useful products obtained from Wattles are timber and gum. The gum is usually of a dark yellow or reddish-brown colour, and is generally found in large masses. That obtained from species growing in arid districts is usually soluble in water, and makes an excellent mucilage; but is not formed in large quantities, and is, therefore, commercially unimportant. The drug known as Caechu is prepared from *Ac. catechu*. The flowers are mostly yellow, in clusters or racemes, loading the air with a most delicious perfume.

The tallest-growing Australian Wattle is *Ac. melanoxylon* ("Blackwood" or "Lightwood"), which often attains a height of sixty or seventy feet. Besides being an ornamental tree, the timber is useful for furniture and implements requiring toughness.

Cultivation of Wattles.—The demand for wattle-bark becomes greater each year, while the supply does not cope with it. The cultivation of wattle is not given to speculation; it is easy, remunerative, and has already entered the dominion of practical farming. Wattles grow in the poorest soil, and require only a moderate rainfall. Their cultivation is firmly

recommended to farmers who have a patch of poor soil which they cannot otherwise profitably utilise. A good return would be obtainable in about five years, and attention to the wattle plantation can be, for the most part, given in spare hours which are available on every farm. Farmers in some districts should be recommended to put as much land as possible under wattle, provided they have the means to wait. At present, only the following wattles are recommended to be planted:—

1. *Acacia pycnantha* (Broad-leaf Wattle).
2. *Acacia decurrens* (Early Black Wattle).
3. *Acacia mollissima* (Black Wattle).

At the same time, many others are worthy of conservation if farmers have them on their land, and further personal proof or trial may show that they are even deserving of cultivation. The three wattles especially named, however, with their long stretch of geographical range and proved value, will suffice for all practical purposes at the present time.

Demand and Supply.—The importance of supply and demand of wattle-bark to European manufacturers can be compressed into a small compass. British and Continental tanners are flagging for ample and continuous supply, and Australia exports in such a small way that very many of the large firms in Great Britain have given over using wattle-bark, falling back on Valonia and other barks more fully and regularly supplied. It stands to reason that reliable leather cannot be produced by an intermittent and inadequate supply of bark, on which the tanner relies when laying down his hides; in fact, in large yards, with thousands of hides always in the pits, it becomes a very serious difficulty, attended with uneasiness of mind and loss, not to be able, through want of enough bark of a class, to work them through successfully. It, therefore, becomes a matter of necessity that the exports of bark be abundant and regular, to such an extent that tanners may assuredly rely on.

Throughout Australia the species of wattle richest in tannic acid are becoming seriously diminished, and there is a general agreement among persons interested in the matters that the various Governments should encourage the replanting of them. At the same time, there are some species of wattle which tanners scorn (partly because the introduction of them would disturb the conditions of their operations), which are even richer than some of the tan-barks in common use in Europe and elsewhere, and there is no doubt that, sooner or later, our local tanners will have to fall back upon these second-grade wattle-barks, unless the cultivation of good wattles is energetically entered upon.

(a) **Soil.**—Many people are of the opinion that wattles will grow on the poorest soil, and that land can be utilized in this regard when it can scarcely be put to any other cultivation, and where not even grass grows. It should be pointed out, however, that bark richer in tannic acid and maturing earlier, may be obtained from trees growing on richer soil; nevertheless, I do not hesitate to recommend farmers to utilize any poor land they may have for wattle culture. Sandy soil is best, lying upon a clay subsoil. In preparing the land, if it is virgin soil, unencumbered with scrub and of a light nature, breaking up of the surface, sowing the seeds, and harrowing is all that is necessary. If the land is covered with scrub or other vegetation, this should be cut down, burnt, and the land prepared in the usual way.

It may be mentioned that any thoughtless kind of cultivation will suffice for wattles, although when once established, they will thrive with scarcely any attention, but like other crops, the better the system of cultivation adopted, the better the yield, and therefore the greater the profit.

(b) **Moisture.**—Wattles like a moderate amount of moisture, probably 20 inches as a minimum. They have been known to grow successfully with 10 inches of rainfall, but ordinary cultivation will not usually succeed with less than 18 to 20 inches. On the other hand, it is not good for wattle trees to have an unlimited supply of water, as they then tend to throw out too much leaf, and the bark becomes languid and deficient in tannic acid.

(c) **Sowing and Germination of the Seed.**—The outer covering of the seed is of great hardness, and under ordinary circumstances it will remain in the ground for several years before germination. Bushfires, however, usually hasten matters; and, as is well known, perfect forests of young wattles spring up in many places after these occurrences. The operations of nature are, therefore, assisted in practice by means of heat, and this heat may be either dry or moist. There have been well-authenticated instances of wattle seed remaining dormant in the ground for over 40 years. An allotment of land was pointed out to me in the Beaconsfield district, which formerly had wattles on it, but the trees and all wattles near by had many years ago been destroyed. After this great lapse of years, the land was ploughed, and wattles sprang up and thrived vigorously.

Seed vegetation has been recommended by some authorities in this manner, viz.: "A quantity of brushwood to be burnt down to the condition of expiring embers. In this residuum of the fire the seed is placed, and mixed with the ashes and charred coals, and the whole is then allowed to remain until

cooled down. The seed is now ready for sowing. If the intention is to sow it singly, by dibbling or in some other way, it will have to be cleaned and separated from the residue of the fire by riddling, or by the aid of an ordinary grain-winnow. If, however, the seed is to be sown broadcast, it will be sufficient if the embers are raked off the heap, and the remainder, containing both ash and seed, stored ready for sowing. The advantage for this method of preparation is that the seed can be sown either broadcast upon the ground without covering, or dibbled in the soil in the ordinary way at any season of the year, and especially before the winter rains set in. Care will, of course, require to be exercised to prevent loss by over burning. A frying pan with a little water put into it is used by some people for roasting wattle seeds."

In the second place a method of treatment is by boiling, or hot water. Place the seed in a vessel, pour water almost boiling upon it, and let it soak for one or two days; the seed is then taken and kept damp in a bag until swelling takes place. The only drawback to this system is that, when sown, the seed must of necessity be covered with soil, and that the operation be carried out in the winter season only. Unless the seed is covered as it is put out, so as to keep up the necessary supply of moisture to complete germination, a change of dry weather would undoubtedly result in its entire loss.

The importance of care in the selection of seed can hardly be over-estimated. They should be gathered from perfectly healthy trees, for it is false economy to use any but the best procurable.

Some Victorian farmers recommend half a bushel of sand to be mixed with each pound of seed sown, and after treatment of the seed with hot water, to broadcast thoroughly, as in the old way of sowing wheat. Their contention is that, if done with discretion, much after-labour will be saved in the thinning process. Others recommend that the seed be soaked and simply sown broadcast on ploughed ground. It must be covered immediately with soil, say, by means of light harrows.

(e) **Pruning and Thinning.**—Wattle trees are sometimes recommended to be pruned. The advantages of this are larger dimensions of individual trees, and hence more bark in proportion; cleaner stems, easier stripping at less expense, less liability to disease, and quicker returns, because the tree will arrive at the stripping stage sooner by having its vitality confined chiefly to the stem. The best period for pruning is during the months of January to March.

Wattle seedlings should be thinned out, as soon as they are big enough to handle, to 10 feet apart. This is perhaps a fair distance, but authorities do not agree as to the precise distance. It rather resolves itself into a matter of common-sense, for one must on the one hand avoid having wattles too close to each other, otherwise "leggy" plants are the result, and on the other hand trees too bushy are not desirable. Wattle seedlings should be transplanted with a moderate amount of care, as they are not the hardiest of plants to stand a change of place in removing.

Time of Year for Stripping.—Wattle barks are often gathered all the year round, whereas they should only be stripped for three or four months in the year (the months recommended are September, October, November and December); out of that season there is usually a depreciation of tannin in the bark. In these months also the sap usually rises without intermission, and the bark is easily removed from the tree. After a few days of rain during other seasons of the year, a temporary flow of sap will cause the bark to be easily detached from the trunk, but then it is greatly inferior in quality.

The Congress of Agricultural Bureaux in Adelaide carefully warns tanners and others against receiving wattle bark damp, pointing out that bark in that state engenders mould "of a most virulent form," is liable to spontaneous combustion if stacked in the hold of a vessel, and, while bark received green will tan hides as fast as bark received dry, still, there is the undeniable fact, in nine cases out of ten that leather produced from bark so received, so stacked, and used for tanning purposes, is spotted, and therefore of second rate or third rate value.

Apart from the intermittent supply already alluded to, it is owing to the greedy and indiscriminating way in which wattle bark has been gathered and the moist condition in which it has often been shipped, that purchasers in England, finding the quality variable, have not entered into regular employment as largely as might have been expected.

It should be purchased in the stick or bundle. In this form its quality can be more readily judged; but when the supply of mature trees diminishes nearly all the bark is chopped or ground prior to shipment, good and inferior being bagged together.

Age and Size of Trees.—Wattle bark should only be procured from mature trees, i.e., from those whose bark possesses the full natural strength, and stripping may commence at the end of the fifth year, and returns undoubtedly commence not later than this period.

Some people fell their wattles before stripping, and use the wood for firewood. Bark-strippers as a rule leave about a third of the bark on the tree, besides leaving unsightly dead trees. It should be borne in mind that dead and decaying trees are a source of danger to the plantation, owing to the harbour they give to insect pests.

It is interesting to note that a greater weight of bark can be produced in five years when cultivated, as against eight-year-old bark in the natural state.

The Most Important Kinds of Wattle Bark.—Wattles are very largely developed in Australia, there being over 600 species. The barks of all are more or less astringent, owing to the tannic acid they contain, but most of them are useless to the tanner, for three reasons—they are either too small a size to strip profitably, their bark is too weak in tannic acid, or they are not sufficiently abundant. Nevertheless, a number are more or less useful, and sufficiently abundant to supply information in regard to the percentage of tannic acid in those barks already used by the tanner.

The late Mr. J. H. Maiden, formerly Government Botanist, and Director, Botanic Gardens, Sydney, has published a most comprehensive catalogue on wattle barks, and I have incorporated some of his observations and personal analysis of *Ac. dealbata* (Silver Wattle), *Ac. decurrens* (Early Black Wattle), *Ac. mollissima* (Black Wattle), and *Ac. pycnantha* (Golden Wattle), and other species.

Analysis

***Acacia dealbata* (Silver Wattle).**—A shrub or small tree closely resembling *Ac. mollissima*, but with branches and foliage hoary, with a minute pubescence on the young shoots; pinnae 10 to 20 pairs, leaflets 30 to 40 pairs, linear, crowded, 4 to 6 mm. long; glands usually numerous; heads small, in axillary racemes paniculate at the ends of the branches, as in *Ac. decurrens*; pod broader, more glaucous.

Widespread in the greater part of Victoria, except the north-west; common on river banks and in sub-alpine regions.

In New South Wales it is scattered throughout the Tableland Division, but usually in the southern portion, and generally at higher elevations than *Ac. decurrens* and *Ac. mollissima*. It belongs to the bipinnate group, but can be distinguished from allied species by the silvery hue of the foliage. In Queensland it occurs in the Stanhope district N. Queensland. Wood tough, firm, and easily worked; sapwood white, heartwood pinkish. Useful for tools, staves, etc. In Tasmania, Silver Wattles grow in spars reaching a height of 60 feet or more.

Some specimens grown at Bombala, New South Wales, were analysed, with the following result: 39.86 per cent. of extract and 21.22 per cent. of tannic acid. They were from trees 12 to 18 inches in diameter, and 20 to 30 feet high. A second sample from the same district gave 39.3 per cent. of extract and 17.1 per cent. of tannic acid. These samples bear a general appearance to *Ac. decurrens* bark, but they are much more rugged, and apparently from an old tree.

There is a great prejudice against this wattle in most of the States, yet analysis show that it is not to be despised. A perfectly smooth, thin, silvery or ash-grey bark, from near Penrith, N.S.W., gave 24.13 per cent. of tannic acid, and 47.85 per cent. of extract. Silver Wattle bark may be assumed to contain about 25 per cent. of tannic acid in the best samples.

Acacia decurrens (Early Black Wattle), petioles decurrent upon the branches.—A handsome tree, with dark green foliage, glabrous, or the young branches slightly tomentose, branches more or less prominently angled, sometimes almost winged. Pinnae eight to fifteen pairs or sometimes even more, rarely reduced to five or six, leaflets very numerous (thirty to forty pairs, or even more), linear from under two lines, to nearly five lines long, according to variety. Flower heads small, globular in axillary racemes, the upper ones forming a terminal panicle. Flowers twenty to thirty in the head, mostly five-merous. Calyx short, broadly lobed, ciliate. Petals with slightly prominent midribs. Pod usually three to four inches long, about one-quarter of an inch broad or rather more, and more or less contracted between the seeds; seeds obovate. It is doubtful whether this tree has ever been observed growing voluntarily in Victoria. Its record for the State seems to rest on the fact that *Ac. mollissima* has been regarded as *Ac. decurrens* var. *mollis*. It has, however, been extensively cultivated as an ornamental tree. Habitat: Chiefly about Port Jackson, New South Wales, and in southern Queensland. Flowering September and October. Gum contains 18.6 per cent. arabin and 62 per cent. of metarabin.

This species flowers in the early spring, whereas *Ac. mollissima* (which it closely resembles) flowers in mid-summer. This Acacia is being grown successfully on a somewhat extensive scale at Coonoor, in India. Analysis: A specimen from Ryde, near Sydney, yielded 48.74 per cent. of extract, and 32.33 per cent. of tannic acid, and a sample from Cambewarra, N.S.W., from trees twenty to thirty feet in height, and six to eight inches in diameter, was found to contain 52.16 per cent. of extract, 32.08 per cent. of tannic acid. A bark of *Ac. Mollissima*, growing in the same neighbourhood, when analysed, gave 47.1 per cent. of extract, but only 24.13 per cent. of tannic

acid. A sample from Nerriga (on the high tableland from Nowra to Braidwood, N.S.W.) was analysed, and gave the excellent result of 36.3 per cent. of tannic acid, with 62.54 per cent. of extract. Height of tree, twenty feet; diameter, eight to twelve inches. It was stripped in January, and analysed the following August. A second sample from the same district yielded 31.75 per cent. of tannic acid, and 62.35 per cent. of extract; while a third sample gave 29.25 per cent. of tannic acid, and 59 per cent. of extract. A fourth gave 24.99 per cent. of tannic acid, and 53.96 per cent. of extract.

Ac. decurrens is an important tan-bark in most of the States, and as the tree grows on the poorest soils, every encouragement should be given to its cultivation. This wattle, and *Ac. pycnantha* together will supplement each other, but it flourishes in situations too cold for the latter. *Ac. decurrens* and *Ac. mollissima* are at present fairly plentiful on some State and other lands of Victoria and New South Wales, where thousands and perhaps millions of seedlings may be seen, forming a dense useless bush, and liable to destruction by bushfires. In these localities it is not necessary to grow seed, but to use a slasher; also thin out freely to admit light and air to the most promising seedlings, and they will have some chance of forming trees capable of carrying a saleable amount of bark. This species is rather liable to attacks by borers, and I am not sure whether it is attacked to a greater extent than *Ac. mollissima*. It is usually a highland, and mountain species, not extending far inland.

Acacia mollissima "Black Wattle" (very or most soft).—A medium-sized tree found in Victoria, South Australia, New South Wales and Tasmania. Foliage twice-pinnate (feather-leaved), softly covered with down or soft hairs, the young shoots tinted with golden yellow. Leaflets short and broad. Glands in great numbers (seen as small swellings or growths on the stalk). Capsule flat, rather narrow, and contracted between the seed.

Uses.—This species provides one of the most useful tanning barks. In South Africa over 300,000 acres have been planted with it.

The bark, rich in tannin, renders this tree highly important. It varies in its tannin from 30 to 54 per cent. in bark artificially dried. In commercial bark the percentage is somewhat less, according to the state of its dryness—it reaches about 10 per cent. of moisture. One pound and a half of Black Wattle bark gives 1 lb. of leather, whereas 5 lb. of English Oak bark are requisite for the same results; but the tanning principle of each is not absolutely identical. Melbourne tanners consider a ton of Black Wattle bark sufficient

to tan twenty-five or thirty hides; it is best adapted for sole leather, and other so-called heavy goods. The leather is fully as durable as that tanned with oak bark, and nearly as good in colour. Bark carefully stored for a season improves in tanning power 10 to 15 per cent. From experiments made it appears that no appreciable difference exists in the percentage of tannin in wattle barks, whether obtained in the dry or in the wet season. Full grown trees, which supply also the best quality, yield as much as 1 cwt. of bark.

The rate of growth is about one inch in diameter of stem annually. It is content with the poorest and driest of sandy soils, although in more fertile ground its growth is more rapid. The Black Wattle is a most useful species for planting in suitable districts as a profitable sideline—but Australian supplies are obtained almost entirely from naturally-occurring trees. The timber is light, fairly tough and strong, but regarded as inferior for most purposes. It is sometimes bored by the large larva of a moth, *Eudoxyla Eucalypti*, also by the beetles of the genus *Phorcantha*. The price of this bark has in England occasionally risen to £20 per ton, and there it is considered one of the best. At Tambo, a quarter of a ton of bark was obtained from one tree, without stripping all the branches. The height of this tree was 60 feet, and the stem two feet in diameter.

Acacia pycnantha (Golden Wattle), a smooth shrub or small tree; phyllodes lanceolate, 1-nerved, rather acute, the lateral veins conspicuous, more or less curved, with a rather large gland on the margin near the base or towards the middle, three to eight inches long, half to two inches broad; heads large, fragrant, golden, 70-to-80 flowered, six to twelve inch racemes, shorter than the phyllodes, calyx shortly five-lobed, tufted-ciliate on the lobes, more than half as long as the glabrous corolla; pod almost straight, two to four inches long, about one-quarter of an inch broad, flattish; funicle short, once folded and thickened upwards into a fleshy aril. Widespread in East Gippsland, Stawell, Ararat, Beaufort in North-Western district, also South Australia and New South Wales.

This tree, which attains a maximum height of about thirty feet, is second only to *Ac. mollissima* in importance for its yield of tanner's bark, its quality is even sometimes superior, but the yield is less, as the tree is smaller and the bark thinner. It is a tree of rapid growth, content with almost any soil, but is generally found in poor sandy ground, often near the sea coast, where *Ac. decurrens* would not succeed, and thus is important for binding rolling sand. Experiments have proved the absolutely dry bark to contain up to 30 per cent. tanning principle, full-grown, sound trees supplying the best quality.

The Golden Wattle has one of the richest tanning barks in the world; and on analysis of some stored material the following extraordinary result was obtained: Tannic acid, 37.5 per cent.; extract, 63.9 per cent.

Generally this wattle loves a warm climate, with only a moderate rainfall. It therefore will not usually flourish at elevations over 2,000 feet. I have already dealt with the matter of distribution. It is essentially a South Australian species, and is common in all districts of South Australia north of Encounter Bay, and is occasionally to be met with along the coast of Kingston to the Glenelg River. Its principal habitat, however, and the one where the thoroughly typical form and largest trees of the species are found, is in the Adelaide hills and plains, from Encounter Bay to Clare.

Acacia penninervis (Hickory Wattle), feather-nerved. A tree attaining sometimes 40 feet, but usually smaller, glabrous in all parts in the common variety, with angular branchlets. Phyllodia from oblong to lanceolate-falcate, more or less acuminate, usually three to four inches long, but sometimes twice that length, much narrowed towards the base, I-nerved and more or less prominently and finally penniveined, the margins usually nerve-like, and often, but not always, a short secondary nerve terminating in a marginal gland much below the middle. Racemes rather short but loose, or with small globular heads of about twenty flowers, mostly five-merous. Calyx truncate or shortly toothed, not half as long as the corolla. Petals smooth. Pod flat, straight or curved, with slightly thickened margins, often four or five inches long, nearly half an inch broad. Seeds ovate; funicle long, dilated and coloured nearly from the base, extending around the seed and bent back on the same side, so as to encircle it in a double fold.

In Victoria it is confined to the north-east and Gippsland hills. Also New South Wales, Queensland and Tasmania. In Queensland it occurs in open forest lands on the Balooone, Mitchell and Suttro Rivers. Wood dark coloured, tough, easily worked; would be useful for cabinet work.

The bark contains 17.9 per cent. of tannic acid and 3.8 per cent. gallic acid. Specimens from Monga, near Braidwood, New South Wales, yielded from the bark of the twigs 22.88 per cent. of extract, and 16.24 per cent. of tannic acid; from the bark of the trunk, 45.5 per cent. of extract, and 16.96 per cent. of tannic acid.

The mature trees, which yielded the excellent result just alluded to, must have each contained half a ton of bark. They occurred on a mountain side sloping west, on poor soil, and associated with the *Exocarpus cupressiformis* (Cherry Ballart), also of extraordinary dimensions.

Other Acacia Trees

Acacia binervata (two-nerved) Black Wattle. A moderate-sized tree of thirty to forty feet, somewhat allied to *Ac. penninervis*, but differing in the venation of the phyllodia, and small flower-heads. It occurs in southern localities in Queensland, and is plentiful along the coast in the Illawarra district of New South Wales. The timber is pink in colour, light, and tough. The bark is used by tanners, though it is not so rich as that of *Ac. decurrens*. Nevertheless, it is a valuable bark; specimens from Cambewarra, New South Wales, yielded up to 58.03 per cent. of extract, and 30.4 per cent. of tannic acid.

Acacia elata (lofty) Cedar Wattle. A small to medium-sized tree, but occasionally reaching 50 feet in height, found along the watercourses and gullies of the Blue Mountains, Moss Vale, Mittagong districts.

This is a most attractive and ornamental wattle, and is largely availed of for planting as shade, shelter, and break-winds. It is a tree of restricted distribution, and were it more abundant, it would come into notice as a tanner's bark. Analysis shows it to contain 55.35 per cent. of extract, and 31.1 per cent. of tannic acid. The timber is suitable for case-making. It is pale-coloured, but likely to decay.

Acacia implexa (plicate) Twisted Wattle. A glabrous tree of thirty feet, with branchlets cylindrical or slightly tapering. The stalk or stems, bearing each a small dense head of numerous flowers. Found at Moreton Bay, Dawson and Burnett Rivers, Queensland, and in New South Wales the tree is scattered through both coastal and tableland divisions. Analysis give 20.54 per cent. extract, and 7.82 per cent. of tannic acid. Wood prettily marked, hard, close-grained, greenish-brown, with pale stripes, a useful cabinet wood.

Acacia nerifolia (Oleander-leaved), Oleander-leaf Wattle. An evergreen tree, forty to fifty feet high, growing in open forests on the Baloo River, South Queensland, and the tablelands and granitic areas of New England, and coastal districts in southern New South Wales. Wood dark coloured and prettily marked, tough, and close in grain. Tannin, 13.91 per cent.; extract, 17.87 per cent.

Acacia Oswaldii (surname), Umbrella Wattle.—Widely spread over north-western Victoria, and in all the other States except Tasmania. A tall shrub or small tree; the phyllodes when young covered with down or soft hairs. Flowerheads

small and round, containing about ten to fifteen flowers. Analysis: Extract, 20.7 per cent.; tannic acid, 9.72 per cent.

Acacia pendula (branches pendulous), Weeping Myall. A handsome tree, the foliage pale or ash-coloured, and slightly drooping. Habitat: On the Maranoa, Mitchell, Dalby and other inland localities in Queensland. Wood fragrant, dark, hard and close-grained; much prized by cabinet-makers. Extract, 17.91 per cent.; tannic acid, 7.15 per cent. It is a dry-country wattle, and apparently of no promise.

Acacia podalyriaefolia (leaves like some Podalyria), Queensland Silver Wattle. This is a familiar wattle cultivated in parks and gardens. It flowers profusely for a longer period than most other wattles, the silvery leaves being very attractive. It is a tall shrub, with ten to twenty small, globular heads of numerous, small, mostly five-merous flowers. Its native habitat is in the interior of Queensland, between Suttor and Dawson Rivers, Wide Bay, and Lake Salvator, etc. Analysis: Tannin, 12.40 per cent.; extract, 29.50 per cent.

Acacia pravissima (very crooked), Ovens Wattle. A small tree, twenty to twenty-five feet high, with dark grey to blackish bark, which yields a light-coloured powder, containing an unusually small proportion of fibre. But the expense of stripping it would bar its use practically, even if the percentage of tannic acid caused it to be a temptation to the stripper. When analysed it gave the following extract: tannic acid, 10.66 per cent. It is a highland species of Victoria and New South Wales, and mostly found on river banks of the Snowy and Ovens Rivers.

Acacia prominens (prominent), Grey Wattle. This is called "Grey" and "Black Wattle." but dealers will not have it, and it hardly pays to cut it up and pass with better bark. The height of the tree is usually about fifteen feet, and diameter less than two inches. It is found on the Snowy Mountains at an elevation of 4,000 to 5,000 feet, but principally in the coastal district of Illawarra, New South Wales.

Acacia saligne (willow-like), Weeping Wattle. A handsome, spreading shrub or small tree, sometimes attaining a height of thirty feet, common in most parts of extra-tropical West Australia, at least towards the coast. In south-west Australia it is the principal source of tan bark, and is said to contain nearly 30 per cent. of tannic acid. It is often cultivated as an ornamental shrub.

Acacia stenophylla (narrow-leaved), Ironwood Wattle or Eumung. A hard-wooded tree, forty to sixty feet high,

with smooth, pointed branchlets. Found along the courses of the Maranoa and Narran Rivers, Queensland. Often in company with the Red Gum Eucalypt (*Euc. rostrata*), and is fairly common on the banks of the Lachlan and Bogan Rivers in New South Wales. It is an ornamental tree, and provides good shelter for stock, also a useful cabinet wood, dark, prettily marked, close-grained, and very hard. It has a rugged-looking coarsely-fissured bark, possessing the characteristic appearance of those of the dry-country wattles. It analysed 24.46 per cent. of extract, and 9.49 per cent. of tannic acid.

Acacia subporosa (full of pores), River Wattle. A tree attaining the height of forty feet, with branchlets drooping and viscid when young. It bears heads of twenty to thirty flowers, mostly five-partite. Confined to the forest gullies of East Gippsland, Victoria, and in the coast districts of New South Wales, on the banks of creeks and rivers. Analysis gave 22.55 per cent. of extract, and 6 per cent of tannic acid.

Acacia verniciflua (varnish exuding), Varnish Wattle. A tall, viscid shrub, sometimes a small tree, is widespread throughout Victoria, including the Grampians, and near Melbourne confined to the silurian forest area. Also Tasmania, South Australia and New South Wales, chiefly on mountains and high tablelands. In the south-east in such situations it does not extend further north than the Bombala district. Its heads are fifty to sixty flowers on twin peduncles. When analysed it was found to yield 23.35 per cent. of extract, and only 3.16 per cent. of tannic acid.

Acacia vestita (clothed), Hairy Wattle. A small tree, about eighteen inches in diameter, usually found on limestone country of southern New South Wales, but unfortunately, not of wide distribution. As it is one of the most beautiful of wattles, it is too handsome for the bark-stripper to destroy.

Economic Utility of Wattles

Wattles have both a direct and an indirect economic value.

Ascribable to the fact that they are plants which bear nitrogen—assimilative root tubercles, they are consequential factors in maintaining the nitrogenous constituents of a fertile soil, and for this reason making good the loss incidental to forest fires. The hard seeds of various species of wattle are able to remain living in the soil for a long series of years. The ensuing list gives a few of the longest known records obtainable for distinct species of wattle:—

	Period of life	Vegetation
<i>Acacia aneura</i>	20 years	56 per cent.
<i>Ac. brachybotrya</i>	57 "	4 " "
<i>Ac. dealbata</i>	15 "	65 " "
<i>Ac. diffusa</i>	59 "	10 " "
<i>Ac. doratoxylon</i>	20 "	6 " "
<i>Ac. elata</i>	30 "	16 " "
<i>Ac. glaucescens</i>	20 "	46 " "
<i>Ac. leprosa</i>	51 "	28 " "
<i>Ac. longifolia</i>	68 "	5 " "
<i>Ac. melanoxylon</i>	51 "	12 " "
<i>Ac. myrtifolia</i>	55 "	5 " "
<i>Ac. penninervis</i>	67 "	3 " "
<i>Ac. suaveolens</i>	51 "	4 " "
<i>Ac. verniciflua</i>	41 "	4 " "

It is worthy of note that these seeds had been kept dry for the periods of time alluded to.

Wattles for Parks and Gardens

Admitting acacias or wattles as a whole are well fitted for garden cultivation, they are not suitable plants for street planting, especially in large cities or towns. In the first instance, they are very liable to become dirty and soiled in appearance in an atmosphere which is at all smoky. Adding to this, the permanency of life is short, and also not regular. At the most an avenue of wattles could rarely be depended upon for more than fifteen years, and after that lapse of time would require continuous replanting as individual trees died, so that the beauty of form would often be interrupted by a succession of empty spaces. Apart from the attacks of the borer beetle, wattles in general are liable to attacks of numerous plant and animal diseases, which may injure the trees or may completely twist out of shape their natural semblance. The natural habitat of most of our wattles is on the borders of forests in open, extensive woods, and often among other trees in forest glades. They like a certain amount of protection by other plants in general. This is applicable to the species with tender leaflets, and to a more or less extent to those with large, flat phyllodes. The species with needle-like or prickly leaves, on the other hand, stand access of air or light much better, but usually have no special decorative or economic value.

With regard to the wattle as the Australian national flower, this, of course, is wholly a matter of public opinion. The wattle has much in its favour in that it pleases the eye and the mind for its fragrance and beauty as a national

floral emblem. But from a botanical point of view, the wattles are not nearly as typically Australian as the Eucalypts. With a total of over 360 species of Eucalypts, only about 20 occur elsewhere, and of these few species all are indigenous to districts not far distant from Australia. As regards the wattles, out of a total of about 800 species known to science, some 400 are Australian, about 100 species native to Africa, and 200 species are native to other countries. Our special merit of the wattle lies in the fact that so many species flower at the same time, early in spring, forming a prominent feature in the landscape and giving first relief from winter's floral dullness. Often fears are expressed about the destruction of the wattle. All I can say to this is that there is not a very serious danger or exposure to injury.

The only damage done to wattles by people removing blossoms is when large branches are broken off, spoiling the beauty of form of the tree and leaving a jagged injury, aiding the penetration of borers or starting decay. Slender branches may be cut when in flower without injuring the tree in the least: and, in fact, pruning the branches would increase the life of the tree and give it a more closely and firmly united growth. A little judicious pruning of wattles is always beneficial.

Conditions Vary for Trees in Australia

It would not be possible to think of trees for dry areas without realising the importance of the Acacia family. But those of us who have had years of experience in growing wattles know only too well their several disadvantages.

The whole of the numerous species are comparatively short-lived, twenty years being more than the average life of most kinds. This, unfortunately, limits their use, for they cannot be considered for permanent features.

Wattles, too, are very liable to attacks by borers, scale insects and fire blight, all of which help further to shorten the life of Acacia trees. However, with all their faults, their virtues are many, in so much that from their ranks can be selected types that will make rapid growth, even under the most adverse soil and climatic conditions.

Wattles do not impoverish the soil, therefore they make excellent protective cover for the permanent trees during the early stages of their growth. The ease with which wattles can be established as pioneer trees in treeless tracts, and their many economic uses give them the right of consideration in any tree-planting scheme.

All wattle trees are readily grown from seed. Gather the seed as soon as ripe, otherwise the pods open quickly, and the

seeds are shed on the ground. Some seed collectors peg down hessian or other similar material under the tree to catch the seed as it is shed from the pods.

The seed ripens with a hard outer covering; therefore it must be scalded or treated in some way to break this before the seed is sown.

For this reason wattles germinate readily after a fire has swept over any area where wattle seed is lying close to the surface. *Acacia* seeds can be sown where they are intended to remain, or they may be sown in seed boxes, pots or tubes.

Cover the sown seed with about half an inch of soil. Resultant seedlings, sown in permanent positions can, when established, be thinned out. Those sown in the nursery must be put out singly, when quite small (one to two inches high), into pots or tubes, and when established, planted out into their final positions.

Sowing the seeds into their permanent positions is well worth trying, even in districts of low rainfall. If it fails, then transplants can be resorted to. Always bear in mind that the plants must never be allowed to get pot-bound before planting them out.

Acacia Species

If you want species that are worth consideration for dry-area plantings the following are worthy to take into account:—

Acacia aneura (Mulga).—Approximate height twenty feet. It is found growing abundantly in dense thickets on the western plains, and in so-called mulga scrubs. Its leaves are relished by stock in times of drought, in fact, sheep have subsisted wholly upon this diet. The Mulga is encircled with two kinds of galls or vegetable excrescence, one astringent and unpalatable, the other edible, large and succulent. The latter, known as "mulga apples," are very welcome to thirsty travellers in the arid and remote interior. The extreme hard, brown wood is used by the aborigines for boomerangs, nulla-nullas, shafts and spears, and as a rod to dig up edible roots. This species ranges throughout the inland parts of Australia from east to west. The Mulga Wattle is content with dry conditions, with a preference for the sandy soil areas. This tree, under adverse conditions, does not carry an abundance of foliage, but would serve admirably as a pioneer tree. Seeds of plants of this *Acacia* are not readily available. Efforts should be made to bring this and many more species of drought-resistant subjects within the reach of intending planters.

Acacia homalophylla (yarran), an inland tree, has a dark brown wood, valued for turnery on account of its

solidity and fragrance. It has been widely used in the manufacture of tobacco pipes. *A. Cambagei* (Gidgee or Stinking Wattle) is often jumbled together with yarran, from which it may readily be distinguished by the disagreeable fragrance of its foliage. It is a very durable timber, much used for fencing posts. The wood is frequently marked with well-proportioned parallel lines, caused by the uniform wavy grain; it is often known as ringed gidgee, and is much in demand for making ornamental walking-sticks and stock-whip handles.

Acacia doratoxylon (Currawang).—Approximate height, sixteen feet, is a shrub found chiefly on stony ridges in dry country, is of some service as food for stock in times of drought. This wattle would be suitable for hard, dry soils.

Acacia salicina (Cooba).—Approximately twenty feet. The Cooba is a drought-resistant wattle, with graceful, pendant branches. In the dry west it is a valuable fodder plant. The timber is tough and heavy, dark brown and handsomely marked. The aborigines make boomerangs of it; land-holders use it for furniture. This wattle could be used along with other species for planting on the margins of shelter belts.

Acacia pendula (Boree, or Weeping Myall).—Approximate height, twenty-five feet. The Boree is another wattle with pendulous branches. It is a useful fodder tree, sheep being very fond of the leaves, and in times of drought it is an excellent standby; in many districts hungry sheep have exterminated it by eating down the seedlings, but horses are said not to relish it.

The wood is hard, of a rich, dark colour, and handsomely marked. While unpolished it has a singular violet-like fragrance, a quality which has brought it into demand for making glove and handkerchief boxes. The aborigines make boomerangs of it. This species is found chiefly in the interior, and is regarded as an indication of good soil. It will stand well even in hot climatic conditions, and makes an excellent subject for planting in groups about any property in the dry areas.

Acacia saligna (Willow Wattle).—Approximate height, twenty feet. This wattle tree is not quite so drought-resistant, but stands well, even on dry, poor soils. Its graceful, drooping habit, together with its abundant flowering qualities, rank it as one of the most desirable forms for ornamental plantings. This species also perpetuates itself by suckering. *Ac. cyanophylla* is a closely allied species, serving similar purposes. The Willow Wattle grows quickly. It usually starts again from side shoots or root shoots after being felled. The wood of this wattle makes excellent firewood, and the bark can also be used for tanning purposes.

Acacia harpophylla (Briglow), a small to medium-sized tree, forms almost impenetrable forests in the interior (especially on the inland downs country in Queensland), known as "briglow scrubs." The scimitar-shaped petioles have a distinctive blue-grey showy brightness.

The bark of all acacias is more or less astringent, and is used in domestic medicine as a decoction or infusion in cases of diarrhœa, dysentery, etc. Other useful products obtained are timber and gum.

TREES TO GROW WHERE RAINFALL IS LOW

Why is it that so many people living in the country fail to plant trees on their farm lands or about their homes? Treeless homes and farm lands are far too prevalent in Australia. Already much information has been disseminated on the many and varied uses of trees to mankind.

One would be quite safe in assuming that in most folk is the love of trees. To have raised a young tree, planted it out when ready, cared for its many needs, and watched with delight its response and development, is to ensure a life-long interest in one of the most absorbing and lasting of pleasures. An interest that will give joy to others in the years to come, and one which may well prove to be of great national value.

The first step in cultivation, therefore, for the intending planter, should his personal knowledge on the subject be limited, is that he should seek advice from some person or body capable of helping him. Every tree or group of trees should be planted with the knowledge that they are the kind best fitted to grow under the conditions prevailing, and when mature, will fulfil the purpose for which they were planted.

It is hoped that all Australians will become tree-minded, and will plant trees, or in some way cause trees to be planted.

It is to people concerned with planting in low rainfall areas that the following information dealing with the various species aspects is written:—

Protection of Trees.—Where trees are liable to be damaged by stock and vermin, adequate protection, in the form of stock and vermin-proof fences or guards, must be provided. Without this precaution, few newly-planted trees survive. It is better to plant a few trees each year and insure their protection than risk loss and disappointment.

For planting work, the cultivation of the area should be thorough. Work the soil deeply, without bringing the clay or subsoil to the surface. Work the area until a fine tilth is

obtained. Where single trees are to be planted, holes should be prepared not less than three feet by three feet by eighteen inches deep, unless the clay line is shallower, when it is unwise to dig into the clay for fear of creating a water lodgment, and thereby causing the tree to suffer from bad drainage. When refilling the hole, use only the best soil, and make up any deficiency. Firm the replaced soil prior to planting.

Season for Planting.—The most suitable season for planting out young trees in the dry areas is autumn, selecting, if possible, a time when the soil is moist. After planting, give the young trees a copious watering, and if the species planted happens to be frost tender in its early stages, protect the young plant by placing around it a protective screen of branches or other material, sufficient only to break the frost without excluding the light unduly. In very dry areas, leave a good bay around the young tree, and mulch the surface soil immediately about the tree with some suitable litter, such as leaf-mould, decayed manure, old straw or other similar material. This mulch can, with advantage, be covered with an inch or so of soil, which not only helps to keep the mulch in position, but prevents fire risks. Be sure to maintain the basin effect to hold any water that falls. In stony country flat stones can be used in place of the mulch, that is, where suitable mulch is hard to come by. Subsequent treatment will consist of keeping the trees protected where possible from winged insect pests and diseases, conserving the soil moisture by cultivation; and mulching and adding to the fertility of the soil by the application of humus or other soil improvers.

When it is possible to artificially water trees, their rate of growth is greatly increased, and artificial watering is equivalent to increasing the rainfall. Many types of trees could be successfully grown by increasing the water supply, where they would fail if dependent alone for water on the mean rainfall of the district. Evaporation of soil moisture is an important factor, and has a considerable bearing on the welfare of trees.

The following figures are interesting, and will give some idea of the rate of evaporation in certain localities:—

Rate of water evaporation from tank exposure to open weather conditions: Melbourne, 39 in.; Merbein, 64½ in.; Laverton, 47 in.

The above figures indicate the necessity for surface cultivation and mulching to conserve soil moisture.

As many valuable trees are ruthlessly destroyed during clearing operations, it is highly important to consider the worth of existing trees before contemplating their destruction.

To be able to procure the desired species of tree is not always an easy matter, for nurserymen, of necessity, grow mainly the kinds that are in steady demand. The State Forests Commission is doing an excellent job in growing and distributing annually thousands of young trees. This good work should be increased tenfold, with special attention given to the types suitable for extremes in climatic conditions.

Home Nursery.—With very little space and equipment the farmer could grow quantities of young trees for planting out. All that is required is an elementary knowledge of the principles of plant propagation. Broadly speaking, trees in general are raised either by seeds or cuttings. Special varieties are, in certain cases, budded or grafted on to suitable stocks.

The chief requirement of a small nursery is an area of land sufficient in extent to raise the quantity of plants required. This area will range from a few square yards in the case of the home gardener to one of some square roods where large quantities of trees are needed. The area should naturally be protected from adverse weather conditions, or provision made to control same.

Within the area there should be a plot of land suitable for the striking of cuttings. The soil in this plot, if not naturally so, should be made friable and well drained. The rest of the area can be devoted to the raising of seedlings, and the care and protection of newly-potted plants. It is very essential to see that all plants are thoroughly hardened off before planting out in their permanent positions. A stock of small-sized pots or the specially made collapsible tin or veneer wood tubes which have an additional length, and therefore do not constrict the root action as do the shallower pots, is essential. These, together with a few shallower boxes for seed raising, a movable screen or so, plus some potting material, and a fine-rosed watering-can is practically all that is required to commence growing one's own trees.

As a guide to intending growers, the usual propagating methods adopted for each tree should be practised.

Seeds of trees are usually sown in spring and put into pots or tubes in early summer. These are usually ready for transplanting in the autumn.

Important.—Almost any evergreen trees must be handled by keeping the soil intact about their roots. This means that they are usually grown in pots or receptacles.

TREES HAVE GREAT VALUE AS WINDBREAKS

Stock owners and orchardists who have shown foresight in planting suitable trees as windbreaks can testify to their

great value as protective agents from storms and bleak weather.

Some native trees that can be recommended are:—

Myoporum insulare (the Boobialla).—A tall shrub or tree, with nearly white flowers, often dwarfed and diffuse on the sea coast, but sometimes twenty to thirty feet high and ten to fifteen inches in diameter. The timber is excellent for firewood, but has an objectionable odour. It withstands exposure well, and is an important factor in checking coastal erosion by wind and water. It is excellent for shade, and the wood takes a fine polish. It can be raised on the beach from cuttings, and some Victorian nurserymen make it one of their specialities by growing thousands of plants every year for their customers for windbreaks alone. It can also be grown from seed as well as cuttings. The cuttings can be planted where they are to remain. Cuttings approximately one foot long, of well-ripened wood, are selected and planted firmly in the ground. Autumn and spring are suitable seasons for putting in the cuttings. The Boobialla, of which there are several varieties, is specially suitable for windbreaks, especially for sandy, dry and saline soils. They can be trimmed even to low hedges. A native of south-west, south and east Victoria, along the whole coast of Gippsland and westward to the Glenelg; near Melbourne, on the basalt, silurian, and red sand areas. Also throughout temperate Australia. Timber: Pale and hard, and only useful for cabinet and turnery. It takes a fine polish. A cubic foot averages 48 lb.

Melaleuca pubescens (Small-flowered Honey Myrtle), is an evergreen, tall shrub, growing to twenty feet high. A native of north-west, south-west, and south Victoria, usually on limesone country, but around Port Phillip confined to the basalt area; at Lorne, Bacchus Marsh, Grampians, on the Murray. Also in New South Wales and South Australia, usually on dry ground or near the coast. Often called "Black Tea-tree." It is readily grown from seed by collecting the seed vessels, which, on drying, shed out the fine seeds. These must be sown in a seed bed or box and covered lightly with soil. The resultant seedlings are then potted and, when established, planted out. This tall shrub makes splendid hedges or windbreaks. It is rather slow in growth for the first two years; needs a 15-inch or over rainfall. Timber: A cubic foot, green, weighs 58 to 64 lb.; air dry, weighs 34 to 36 lb.; and dry weighs 29 to 30 lb. The wood is pale when fresh, drying a pale pinkish-brown. It is very tough, hard, dense and durable, is apt to develop star shakes, but otherwise dries without cracks. The medullary rays are very fine, and the annual rings not prominent, the latter being irregular. This plant was formerly placed under *M. parviflora* Lindl., which

has a typical paper bark, and appears to be confined to West Australia. It is one of the most important plants for fixing moving coast sands.

Eucalyptus cladocalyx. var. *nana* (the dwarf or bushy Sugar-Gum tree), is an evergreen tall shrub or tree. This bushy form of the well-known South Australian sugar-gum tree is certainly an acquisition in so much that it holds its foliage much closer to the ground than the typical form. The tree is evergreen, grows to approximately twenty-five feet high, and is easily raised from seed. The seed capsules are collected and dried, when the tiny seeds fall out. Where the rainfall is twenty inches or above, the seed can be sown *in situ*; in lesser rainfall areas better results are obtained by raising the plants and planting out from pots or tubes. Young plants are frost-tender in some localities, and very liable to attack from hares, rabbits and caterpillars.

Precaution must be taken to guard against these pests. Protection from caterpillars can be obtained by spraying the plants with lead arsenate (2 oz. per gallon of water).

Stands Dry Climate.—Authentic cases of stock poisoning through eating the foliage at certain stages of its growth are recorded. Plantations of this variety should, therefore, be fenced off from stock. The tree makes rapid growth, and will stand dry conditions, even to a twelve-inch rainfall.

The sugar gums are liable to attack by borer pest, but even so they continue to thrive for many years. Probably the best Eucalypt for dry climatic windbreaks.

Callitris robusta (Murray Pine).—A tree up to sixty feet high. It is distinguished from *C. propinqua* by the usual absence of any furrowing at the junction of the cone-valves, and by the more slender and lesser male cones. It is usually a tall, pyramidal tree but grows better towards the north than in the extreme south. Found in north-west, south-west and south Victoria, and near Melbourne, on the basalt plains; also in New South Wales, South Australia and Queensland. The tree will grow on poor soils, and stands great heat and a considerable degree of drought. Under such extreme conditions, however, it is of slow growth, and may be dwarfed to a shrub. It readily establishes itself from seed, and often forms a dense, low scrub, which requires thinning before it will yield good timber.

The timber varies from light to dark brown, sometimes with a reddish tinge, and a paler sapwood, and is fairly dense, a cubic foot weighing 40 to 45 lb. when seasoned. Although resistant to white ants, it is liable to dry rot. The oil distilled

from the twigs and fruits contains pinene, limonene, geraniol, borneol, and acetic acid.

This tree is easily propagated from seeds. The seed cones are gathered and put to dry. The small seeds can then be shaken out of the cones, which open on drying. Sow the seed in prepared boxes or seed beds in the autumn and spring. Pot or tube the resultant seedlings, and plant out when established. This Murray pine, whilst naturally preferring the sandy soils, will do reasonably well even on heavy volcanic country.

For windbreaks several lines of trees planted at approximately twelve centres would be most effective. The plantation could then be margined with a more bushy evergreen, such as *Boobialla*. This would then ensure a foliage protection to the ground line. *Callitris calcarata* (Red Cypress Pine) would also serve the same purpose as *C. robusta*, although not quite so drought resistant.

NATIVE TREES AND SHRUBS GROWN FROM SEED

The time has arrived when more attention should be paid to growing native trees and shrubs from seed, thus adding to the beauty of the garden and the country generally.

Amazingly little is known in regard to collecting seeds of native plants and growing them, yet the subject is of importance to those interested in the conservation of our rapidly diminishing flora.

While the Wild Flowers Protection Act in most States inflexibly forbids the picking or removal from the bushlands of a certain number of native flowering plants there is nothing in it to indicate or prevent the public from collecting the seed after the flowers have matured and seeded. All that is required is to go out in the bushland with a tin or box, and gather the seeds when ripe, and write the name of the trees or shrubs, with descriptions of the plants, on the containers.

The custom or practice of collecting wild flower seeds will assume the fascination of a hobby, and will grow speedily upon you. Our bushland flowers, for the most part, do well in the open, and if you desire to recognise a certain shrub in a particular area when in flower, place a stick or stone nearby.

Wealth of Material.—In Australia there is an enormous wealth of natural flora, which is possibly rarely equalled throughout the world. For some reason or other, this fascinating section of horticulture has been practically left untouched in the average Australian garden.

It should be made known publicly that most of the indigenous trees and shrubs, etc., are as easily cultivated in gardens as those which have been introduced from abroad.

Generally speaking, these plants are quick growers. Another asset is their ability to withstand drought and exposed conditions far better than the introduced ones.

If suitable situations are chosen, plants coming from the north-east and west will thrive in southern conditions. Many people complain about the difficulty in cultivating our native plants, expecting them to thrive in any old corner of the garden. Possibly the main reason for many losses is the moving of larger or semi-established plants.

Often people, when on a visit to the country, see nicely shaped or semi-established plants, which they would like to remove to their own garden. The removal often results in damaged roots, the soil is lost from attachment to the roots, and the plant thereby is quite useless for removal. It is always wise to lift the smallest plant available.

Colour and Usefulness.—The range of colour is possibly the largest one could desire. Blues, pink, red, orange, yellow, violet, together with combinations of all, can be obtained. Again, colour can be obtained throughout the year, especially during the dull winter months.

For the landholder requiring timber, or shade and shelter for the home, or for cattle, Australian trees are unsurpassed. Of course, the Eucalypts and Acacias are well to the fore, but the selection is by no means limited to these. From the fodder viewpoint, Australian trees and shrubs have proved their worth also.

Soil and Treatment.—Drainage is possibly one of the first essentials when site selecting. Very few native plants can tolerate excessive moisture. As to the actual soil, it should be light and open, with a good humus content. The addition of coarse sand to heavy soils is essential. On no account should manure, either in the form of animal or artificial fertilisers, be present. The absence of lime is necessary, but a little bone dust in hungry positions contributes to promote growth.

The best form of stimulant is the annual mulch of leaf mould. In their natural state, it is nature's only method of enriching the land. As native plants object to close cultivation, this mulching is an added protection to surface roots. All that is necessary is to keep the area well free from weeds.

Sow Seed in September.—For Victorian conditions the most suitable time for sowing is September. This will then give the young seedlings ample time to make good root growth

before the hot weather sets in. Many seeds of Australian plants are hard cased. They mainly belong to the family *Leguminosae*, or pod-bearing family. They include such genera as *Acacia*, *Cassias*, *Crotalarias*, *Hardenbergia*, *Kennedya*, etc. These seeds will germinate far more readily if placed in hot water and allowed to soak for several hours before planting.

Seeds may be sown in pots, boxes, or in open beds. If a small glass frame is possessed, seeds sown in pots and boxes can be readily raised, although this frame is not absolutely necessary. Pots and boxes must be well drained.

The soil must be light and friable, consisting of sandy loam, leaf mould and coarse river sand. Sow the seed evenly, but not too thickly, as the young plants do not want to be crowded. Many of the Australian trees and shrubs can be propagated by cuttings of semi-ripe wood.

● AUSTRALIAN FOREST CROPS AND THE PAPER INDUSTRY

The long-range prosperity of the paper industry depends on an assured supply of timber, and for that reason Australian Paper Manufactures Ltd. is planting pine trees on a scale which must be considered big by any world standards. This is only made possible by the use of mechanical tree-planting machines, the fleet in operation by the A.P.M. being capable of planting 50,000 trees a day. The main trunk of the tree, when matured, will be cut into assorted sizes of timber, and the residue will be used for paper pulp.

This year about 2,000 acres have been planted in Gippsland, with an estimated total of two million trees for the year. Next year and subsequently, 3,000 acres will be planted. The effect in future will be to supply a continuous proportion of the Company's requirements of long-fibred pulp.

In order to get the earliest possible crop the planting is at the rate of nearly 1,000 trees an acre. These initial heavy plantings are planned to enable the Company to secure some of the crop for pulping at the earliest possible date.

At present the Company has a large labour force cutting fire-killed pines in the South Australian Government's plantations at Penola. This pine must be salvaged quickly after burning, as rotting soon renders it useless. This pine is being pulped at Maryvale, and helps to maintain supplies of scarce long-fibred pulp.

Predominantly to plant trees, and incidentally to supply pulpwood lumber and sawn timber to A.P.M., a subsidiary company, A.P.M. Forests Pty. Ltd., has been formed. The subsidiary is also charged with the acquisition of Eucalypt forests for pulpwood production.

When Maryvale Pulp Mill extensions are in operation the present requirements of about 50,000 cunits a year will be increased to 90,000 cunits (one cunit represents 100 cubic feet of solid wood).

A great deal of this pulpwood is drawn from poor quality foothill forests, which only carry wood of pulpwood or firewood quality. Regrowth resulting from A.P.M.'s operations will, in time, form forests of much greater value than present fire-damaged, lightly stocked forests.

Lumber production for conversion into building timber for A.P.M.'s housing and construction programme amounts to about six million super feet of logs a year at the moment.

The Company's Eucalypt forests are to be managed to produce pulpwood in perpetuity on short rotation. Silvicultural treatment will begin soon to ensure that all areas are properly stocked with trees.

Supplies

The world-wide shortage of long-fibred wood pulp has steadily become more acute, and the prices of oversea pulp have soared to fantastic levels. Mainly because of this shortage, it has become necessary to use small amounts of substitute materials, such as sorted waste papers and cooked straw, in a number of products. Here is the story of the steps being taken to intensify collections of waste.

The cost of packing materials depends on the cost of supplies for the paper mills, and "waste paper" is an important source of raw materials. It behoves every member of the community to help to save "waste paper." "Waste paper" consists of newspapers, writing paper, wrapping paper, cardboard, food packets, cigarette packets—in fact, everything containing paper or cardboard in any form, printed or otherwise. No less than 1,500 tons of "waste paper" are needed every week to keep A.P.M.'s mills supplied, and it has become exceedingly hard to obtain. However, the whole community will gain by saving the waste, because the Company will collect it and put it to the best advantage.

Power Resources

The range of machinery installed by A.P.M. is vast. It includes tractors, power saws, winches, compressors, trucks, fork lift trucks, front-end loaders, diesel electric locomotives, turbo-alternators, electric motors, and so on.

To grow and produce timber supplies and make roads A.P.M. has an aggregate rated H.P. (horsepower) of 3,800. The company uses a great variety of vehicles to transport raw materials and products within its mills. Total rated H.P. of

these is 6,000. Great volumes of power are required to run the machines of the paper and board mills. A total of 47,100 H.P. is installed for this purpose. A.P.M. can call on 2,900 H.P. to cut and convey its brown coal, and 200 H.P. is available for quarrying limestone.

The pulp mill makes substantial calls on power, and to make pulp A.P.M. has 7,500 H.P. installed in electric motors. In addition, many thousands more H.P. are used by other agencies in hauling raw and finished materials by road, rail and ship.

Brown coal from the Company's open cut at Bacchus Marsh played an important part in A.P.M.'s power generation. The usage from this source was 153,000 tons. In addition, 950,000 tons were obtained from S.E.C. Yallourn North open cut.

The demand for grades of paper and boards made by A.P.M. far exceeds the Company's ability to supply. This shortage is merely a reflection of a world-wide shortage. The world-wide famine of paper and board products is attributable to the rearmament programmes in certain countries, and the increased spending power of a number of nations receiving financial aid from the United States of America, who were able to join in the competition for world supplies of pulp and paper.

Barking Trees

In conjunction with A.P.M. Forests Pty. Ltd., experiments are being conducted to see if chemicals can be used to kill trees marked for pulp, causing them at the same time to peel off their own bark. At present the barking of trees is a cost charge by contractors in the cutting of pulpwood and preparation of billets.

PAPER MANUFACTURE IN AUSTRALIA

The industrial pursuit of paper making is one of the most useful that has been invented, and paper has acquired a step forward to a degree of importance which would not have been believed in the 18th century. It has been truly said that paper has contributed more to the advancement of the human race than other material employed in the application of science to practical purposes, and its manufacture constitutes an industry depending more closely than any other on the progress of civilisation. Its uses are now beyond number; the call for it is so universal that it has become an article of first pressing need, and one that is daily entering more and more largely into the ordinary wants and plain life of all groups of peoples. In the paper trade, as in other

mechanical industries, there has been great progress made in the last half century. Chemists and mechanics have each contributed their part. The former have furnished improved methods of washing, bleaching and colouring the paper stock; while the mechanical improvements also have been many, both for boiling, running out, drying and finishing the pulp.

The vegetables from which paper can be made are countless, but the difficulties are to obtain them at a sufficiently low price to be used profitably and to secure a continuous supply without interruption. The multitude of vegetable fibres that have been suggested for the use of paper-making is embarrassing, but paper pulp mills have recently been established in Tasmania and Victoria to manufacture pulp from hardwood timber on a large scale, and a wide range of printing and other papers is being produced.

The following remarks apply to the newsprint industry in Tasmania. Other methods have been developed to manufacture kraft wrapping papers on the mainland, where mixed Eucalypts of very poor quality, such as Swamp Gum, Apple Box, Mealy Stringybark, Common Peppermint, Long-leaf Box, and River White Gum are used. These are too poor for milling purposes, but are used to make paper.

"The story of the conversion of giant gums into newsprint is dramatic and simple," says the Launceston "Examiner." "After nearly twenty years of patient experimental work on the manufacture of paper from Eucalypt timbers it was found that out of more than 400 kinds of Eucalypt trees in Australia only one was actually suitable for grinding into paper pulp—*Eucalyptus regnans*, commonly known in Tasmania as Swamp Gum. After most of the difficulties and hazards had been overcome, a company was formed in 1938 to make newsprint in Southern Tasmania. The type of forest suitable was strictly limited, because its main growth had to be *Euc. regnans*. After careful deliberation it was decided to build the paper mill at Boyer, because it was close to extensive forests of the species most suitable for the purpose, water, power supply and shipping facilities.

"Before logging for newsprint timber is commenced much preliminary work is necessary. The timber areas must be surveyed and assessed by ground reconnaissance, in conjunction with aerial photographs. Necessary plans are usually prepared from aerial photographs with the minimum of ground work. Finally, when the location of the mill timber belts is known, surveys for railways and roads must be carried out. Then the logging areas are planned and mapped out in advance, and details of method of logging, hauling and loading are decided upon before cutting commences. The harvesting of timber from each area is planned in such a way as to achieve

complete reafforestation by natural means after logging is completed.

"The trees are felled by axe and crosscut saw. Many of them are over 250 ft. high, 10 ft. in diameter, and some estimated to be 350 years old. After felling they are hauled by tractor weighing 20 tons, and hauling logs up to 20 tons. To facilitate this, a logging arch is attached to the rear of the tractor. The logs are lifted by mechanical means under the frame of the arch, so that only one end drags on the ground. This allows heavier loads to be carried in less time. A tractor, over reasonable distances, can haul 50,000 super feet (150 tons) in one day.

"When the logs reach the landing, situated by road or railway line, they are loaded on to specially designed flat railway cars or motor trucks by wire cables operating through blocks rigged to long poles or to trees with their tops lopped. The loading cables are operated by winch, driven by steam, diesel or petrol. To the loading end of the cables are attached large steel tongs. These grip the log as it is swung into the air, moved into position and lowered to the rail car or motor truck. One railway truck of logs contains about 9,000 super feet—about 27 tons (half wood moisture or sap)—enough wood to make ten tons of newsprint. About 25,000,000 super feet (75,000 tons) of logs is required yearly by Boyer—300 tons a day.

"Fire protection is very important. Australian Newsprint Mills Limited spends thousands of pounds a year on equipment, petrol and in actual fire-fighting, mainly in areas adjoining its forests, in order to keep external fires out.

"The logs arriving at the mill at Boyer by rail are lifted from the trucks by gantry crane. They are sorted according to quality and kind, and fed to the woodmill in fixed proportions.

"They consist of old growth, gum top and stringy bark. Usually a fortnight's supply is kept in the log yard, about 1,000,000 super feet for present output, for protection against various contingencies.

"The woodmill plant is designed to cope with logs up to 32 feet long. Longer logs are rapidly cut in the yard with an electric saw. The gantry has a span of 200 feet, and carries the logs to the mouth of the mill. They are hauled mechanically 20 ft. per minute, and are washed during their journey to the woodmill. All logs more than four feet in diameter are lifted by crane to the frame saw, and cut to smaller sizes. Those smaller are hoisted to a log deck with moving chains in its floor, and carried to a log stop and kicker. This passes them singly, as required, to the log turner

and pusher. This loads them and turns them as required on the log carriage.

"The log is cut at terrific speed by twin six-foot circular saws set one above the other. A flitch about 32 ft. long, 4 ft. wide and 7 inches thick falls clear from the carriage as the dogger releases the steel grabs. By gravity rools and conveyor the flitch is taken to an "edger" that opens roller jaws and takes it down to five 32-inch saws. It comes out lengthwise, into six cants roughly 7 x 7. The cants move up an inclined deck to the slashers—seven saws set four feet apart, whirling on the shaft at 1,000 revolutions a minute. In a split second the cants are cut into billets four feet long, fall out of sight on to a quadrangle conveyor chain and are carried along to a sorting bench, where all faulty wood is rejected. The rejected wood is carried away by conveyor for fuel. This conveyor also carries rejected billets to the jaws of a hogger, which chops them into chips. The chips go on to another conveyor to the boiler furnace.

"The accepted billets are sorted into squares and offcuts, stacked into steel cribs, and taken out to the road by an elevated electric truck. From here they are taken to the ground-wood mill as required. A crane hoists the cribs to hydraulic lifts. From these, attendants pull the billets into the magazines of the grinders. The billets reappear as a porridge-like substance. The six grinders, each of 35 tons of steel and stone, work in pairs, each driven by a 3,600 h.p. motor. In each grinder is a six-ton grindstone of synthetic material, with a grinding face four feet six inches wide and a diameter of five feet two inches.

"The porridge-like stock flowing over the dam at the base of the grinder is 95 per cent. water. The other 5 per cent. is paper material or pulp. This means that to every two-ton crib of 50 per cent. moisture wood fed into the grinder the showers have added 18 tons of water. The stock leaves the grinder and passes through a header into a tiled channel, and it flows past an agitator. At this point a brightening re-agent (zinc hydrosulphide) flows in solution into the stock to lighten the colour of the paper. The stock now passes to the groundwood screen mill. Here it moves into a retention flume and thence to a coarse screen, a revolving, perforated drum, with 5/16ths of an inch perforations. The stock is washed through these perforations by a shower, and the coarse bits tip out of the open end as waste. The accepted stock is then pumped up to a series of screens for washing and screening, making it "just so" for paper making.

"During this process, tannic acid, acetic, and other wood acids are drawn off the waste water. As the filter rotated slowly the waste water flows through wire, leaving a moist

cake of pulp about one-quarter of an inch thick, and containing 8 per cent. paper material. This is removed by a shower and discharged into a dilution flume for further showers.

"From the washers, the much-diluted stock goes through a mixing pump and through wood stave pipes to fine centrifugal screens with holes 4-100ths of an inch in diameter. The reject fibres from these pass to a tailing screen of .05 inch mesh to be given another chance. If there are any oversize fibres from this screen they go to waste. High pressure white water showers play on both screens. All the good stock now flows to the "deckers" on the ground floor, for the last stage of the groundwood pulp preparation. It runs over a series of cylinder moulds covered with fine mesh wire cloth, leaving a coating of stock. This is lifted off the rotating mould by a riding roll and deposited in the groundwood storage tank underneath. Much of the water runs through the wire cloth to a white water storage tank. At this stage the pulp lifted off the mould contains $3\frac{1}{2}$ per cent. paper material, and it is kept moving by agitators to prevent the fibre from settling and to keep the stock consistency constant.

"The stock now in the groundwood storage chest is pumped to storage tanks to blend. It then passes into the proportioner to be mixed with imported sulphite pulp and waste newsprint in such proportions that the paper produced contains about 80 per cent. of Eucalypt groundwood to about 20 per cent. imported softwood sulphite pulp. Sulphite pulp, with its longer fibres, is mixed with the ground stock to toughen the paper.

"The pulp now is almost ready to flow to the machine. It is pumped into a refiner at the start of the machine. The refiner is used as a corrector for the formation and finish of the final paper. As final protection from oversize material, the stock passes through large rotating, slotted screens to the machine-head box. Whitish and watery, it flows from the head box on to the forming wirecloth in a narrow, flat jet the full width of the machine, and moves swiftly forward, draining all the time. It is now approximately $99\frac{1}{2}$ per cent. water. Enough water must be removed by the machine to turn out paper at the reel end containing only $8\frac{1}{2}$ per cent. moisture.

"The fourdrinier machine is the heart of the process. The wire to carry the pulp 40 ft. over the forming table is nearly 15 ft. wide and 90 ft. long. Joined like a roller towel, moving forward endlessly, it is of woven bronze, 60 meshes to the linear inch. Beneath this paper-making surface are 20 rubber-covered rolls mounted on ball bearings, and kept moving by the moving wire screen. Where each roll

touches the taut wire, water is drawn through. The stock passes now over suction boxes connected to vacuum pumps that draw air gently through the sheet, taking water with it. As it leaves the last suction box the paper still contains only 4 per cent. pulp. A further 8 per cent. of water is taken from the wet web, leaving 12 per cent. solid mush.

"Forty thousand gallons of water is taken for every ton of paper produced, and much of it flows back beneath the wire and is recirculated. The mill takes 3,500,000 gallons of fresh, filtered water daily.

"The pulp, still like wet blotting paper, is able for the first time to sustain itself as it flows over a gap of about six inches between the "wet" end and the "dry" end of the machine. It is then taken on an endless blanket 50 ft. long, carried through two suction presses, and more water is withdrawn.

"Each press has a bottom suction roll and a top roll of fine polished Scotch granite. As one side of the paper lies on the blanket, passing beneath six to seven tons of pressure from each granite roll, it is made rougher than the other side. Leaving the second press roll, the paper is still only 34 per cent. stock, the other 66 per cent. being water. It passes to the smoothing press. This removes most of the wire and felt marks from the lower side, making for even printing on both sides. The paper still contains well over 60 per cent. by weight of moisture. It now goes to the dryers, and it passes on an endless belting 15 ft. wide over 42 polished cast iron cylinders, each 5 ft. in diameter, and weighing six tons. They are steam-heated to 250 deg. Fahr., and are in two rows, upper and lower, and the paper passes from one cylinder to the other. Through the dryers the paper travels 950 feet, plus another 100 feet over the wire and between the press rolls, making a total journey of 1,050 feet from watery stock to finished paper in a little under a minute.

"The paper is passed from dryer to dryer by endless cotton felts. These, with the aid of hot, polished cylinders, smooth the paper and prevent it from cockling. The terrific amount of vapour rising is taken from the dryers by covering the drying section with a wide canopy, and the moisture is withdrawn by exhaust fans. Temperature and humidity in the machine room are regulated constantly.

"A cool dryer cylinder and a cold bronze roll at the end, both cooled by running water, reduce static electricity generated in the moving paper, and help even out the drying by condensation. They also cool the paper, so that it will not continue to dry in the reel. The sheet, still in a plastic state, finally passes through a stack of polished, chilled iron

rolls, known as a calender. As the paper comes off the machine it is wound on a winder. An overhead crane picks up the full reel and carries it to another winder, where it is rewound and cut to the smaller reels used on paper presses.

"Now we have a reel of paper complete. A very short time ago it was part of a forest giant being hauled into the woodmill to be sawn up. The paper is now wrapped and sent on its way to the warehouse, and transhipped to its final destination, the press rooms of all Australian newspapers. Later on you can have the forest on the breakfast table."

ECONOMIC UTILIZATION OF TIMBER WASTE

Australia is going to be actually in great want of timber unless we use our forest resources more providentially than we have done in the past. Mostly all the best stands of timber are practically exhausted or cleared for settlement, depleted of their valuable trees, or laid waste by fire. Afforestation and reafforestation, always insufficient, was retarded to a great extent by war hostilities.

The entire use of existing timber resources is the chief object of the Forest Products Division of the Commonwealth Scientific and Industrial Research Organisation, which contends that 90 per cent. of waste can be cut to 50 per cent. by advanced methods and by discovering new uses for waste. That means we could make five times as great use of the wood at present in our forests, capable of being used to our advantage. These forests are now producing something like £ 20,000,000 worth of green timber a year, as raw essentials for our numerous forests products activity.

Before the second world war, Australian timber consumed was about 1,000 million super feet a year. And one-third of this was from other countries. Now we are absorbing 1,200 million super feet a year, of which all but 100 million super feet is our own local timber.

About 200 research workers are employed in the Forest Products Division of the C.S.I.R.O. to free or immune timber from the dreaded lyctus beetles, well known as borers. It has brought into use a comprehensive assortment of timbers, which formerly were of only secondary value, because of their inclination to borer attack. Many of the beautiful Queensland and Northern New South Wales timbers which formerly were regarded as susceptible to borers have now come into their own for high-quality furniture, flooring and plywood. This is typical of many lines of research carried on by the C.S.I.R.O. to bring into use these fine trees from waste to valuable timber.

In Australia there is at present no real recognition of the unnecessary waste of timber that takes place in our forests from year to year, and enormous waste is pathetic in whatever forest you may visit.

It is high time a method was evolved to deal with this wantonness that would give satisfaction to all concerned in the matter. What I have in mind, and which I think most appropriate and most needed, is a development plan of several industries, or better still, a series of associated manufacturers, whereby some of which might use the waste products of others. It then boils down to the fact that research would be necessary to go into the matter of suitability of the material for various purposes and developmental uses, also for markets for that which is produced.

No doubt there are many important industries capable of developing the material. A wood waste exchange might be set up; others in a lesser degree may be industries using small wood, etc.

It is up to the wood industry to find a solution for this scandalous wood waste, and I am very pleased to note that the Institute of Science and Industry has taken the matter in hand, and published, under the authority of the Executive Committee, a very useful brochure on "Wood Waste." Some extracts from it I subjoin in this.

"In the utilization of timber growing in the forest, by conversion into articles of use, there is enormous waste at every stage of the conversion. Indeed, it is doubtful if there is any other source of natural wealth that is so wastefully exploited. In the forest itself great waste occurs, owing to the attack of fires and disease, and to the occurrence of defective or twisted logs and over-mature trees, which are not economical to remove for conversion at the mill. It is difficult to form anything like a correct estimate of this, but the United States Forest Service considers that only 25 per cent. of the present producing forests is sawn lumber. In the logging operations once more great waste occurs. A fair estimate is that 30-50 per cent. is used, and the balance allowed to rot and feed the forest fires—and in so doing cause further loss of wealth. Tops and branchwood and stumps account for most of this. The hewing of railway ties and squared piles, etc., is another source of great waste. Whatever the amount may be in Australia, it is certainly not less than in America, as is evident to anyone going through the forests when the mill owner is at work.

"In Europe these losses in the forests are greatly reduced, owing to the thickly-settled population and the high price of timber, and also to the fact that so much of the forest is plantation, worked systematically under proper management.

The waste in these countries is estimated at only from 4 to 10 per cent.

"There can be no doubt that, as Australia becomes more settled, a large proportion of material now valueless will come within the range of economic utilization. Unfortunately, by the time this is attained our forests will have been seriously depleted. The waste at the present time is no doubt largely necessary, but if methods can be devised to render even part of this material useful, a great service would be done to the community, and great assistance given to the forester in his problems of management. It would pay to establish industries for the utilization of this material, even if no loss were incurred and the ministry just enabled the forester to remove the useless and dangerous timber from the forest. The forester is on the alert for methods of diminishing waste and of economically using over-mature or defective material. The relative position of the forest as regards the centres of industry has a very important bearing on this question.

"The establishment of wood-producing industries within close range of the forests would provide the most satisfactory solution of the difficulty.

"From the forest the logs go to the mills to be sawn into timber, and here again the same waste is noticeable. Varying estimates are made as to the proportion of waste at this stage. It will, of course, depend upon the nature of the timber, the size of logs, the purpose for which the lumber is required, and milling efficiency. From 40 to 50 per cent. is, however, a fair estimate of the average loss. A rough division of this loss is—

Bark	10-12 per cent.
Sawdust	12-15 per cent.
Edgings, trimmings, etc.	15-20 per cent.
Careless manufacture ...	5 per cent.

"Little more than 20-25 per cent. of the tree comes into actual use. A still further loss occurs in the conversion of lumber into finished articles at the factory. This is, however, comparatively small, and much of it is used as fuel, and not properly regarded as loss.

"In considering mill waste, the problem should be easier of solution than of forest waste, for the material is gathered into centres, and, moreover, it is usually a source of considerable expense to get rid of it by burning. The constant association of fire dumps, or destructors, with timber mills is one of the most noticeable features of the industry. It is very rarely that a mill can be seen without an incinerator. A few situated in large centres of population can convert all

their waste into power and sell what is not required. Such conditions do not often apply.

"In America it is estimated that the wastage of logging and conversion amounts to 7,000,000 cubic feet per annum. In Canada it is estimated at from 50,000,000-120,000,000 dollars value, or 10-15 dollars per head of population. The Conservator of Forests in Western Australia estimates the waste in that State at 500,000 tons per annum. This is based on returns from fifteen mills. In small mills it amounts to 24 tons per day, and in a big mill to 190 tons, exclusive of sawdust, hollow hearts, and fuel for boilers. If this is a fair guide to the losses in other States, these can be estimated from the relative amounts of timber cut in Australia in 1914. The following round figures are taken from the Commonwealth Year Book:—

Timber Cut or Hewn, 1914

	Super Feet
Victoria	84,000,000
Queensland	168,000,000
New South Wales	141,000,000
South Australia	118,000
Western Australia	227,000,000
Tasmania	52,000,000
Total	672,118,000

"In Western Australia the sawmiller gets 38.7 per cent. with jarrah and 30.4 per cent. with karri as saleable timber. In the Eastern States the loss is somewhat less in proportion, owing to sounder timber and better price for scantlings.

"The following table gives the results of milling operations in Western Australia in 1913:—

Timber Milling in Western Australia, 1913

	Super Feet
Timber felled	562,594,000
Sawn timber produced	218,908,000
Fuel for boilers	34,368,600
Rotten hearts	68,737,200
Sawdust	34,368,600
Shorts	68,737,200
Waste suitable for distillation or other purposes	137,474,400
Or 379,000 tons.	

"On this basis, the total mill waste in Australia would be about 1,500,000 tons per annum. This is a stupendous amount of potentially valuable raw material to destroy.

Much of it is useless for conversion because of bad shape, twisted grain, knots, gum, pockets, or rot. There remains, however, a good proportion which might be converted into wealth if proper methods are used and an organized attempt made to develop these. The secret of success, or otherwise, of tackling this very important problem lies in organization. Even if methods are developed for the conversion of waste wood into useful products, the possibility of bringing them into operation depends upon the organization of the supply of material and markets for the products. Already in other parts of the world some industries have been established which are helping to reduce the deplorable waste. Some of these can be established in Australia under proper conditions, and others offer possibilities provided that the investigation can result in devising improved methods of treatment, higher yields of products, or more economical plant, resulting in lower costs of production. Investigation might be usefully tried in Australia to the main directions in which efforts are being made elsewhere to utilize wood waste.

"The waste is in two forms, mainly, viz., trimmings, edgings and slabs, and sawdust. Some of the methods applicable to the latter can be applied to the former, if it is first reduced to chips. These are examined here, but sawdust will be treated distinctly.

Trimmings, Edgings, Slabs, etc.

"The main possibilities of use for these forms are:—

1. Manufacture into small articles.
2. Manufacture of articles of laminated or built-up construction.
3. Use as fuel.
4. Use for manufacture of paper and other products from wood pulp.
5. Conversion of alcohol (treated with sawdust).
6. Distillation to yield charcoal, acetic acid, acetone, etc.
7. Conversion to producer-gas for lighting, power, etc.
8. Excelsior or wood wool.

Producer Gas From Mill Waste

"Sawmill waste has proved very efficient as fuel in gas producers. Many such plants are at work in the Western Australian goldfields, and green feed fuel is cut for the purpose.

"United States investigations conclude that the use of wood waste in properly designed producers is entirely practicable, and where the cost of dry wood falls below that of coal, it is economical. The more general use of wood in producers would be of value to manufacturers, wood-using industries, and manufacturers and customers of power. In Australia the

down-draught type of producer is commonly used, and it is the development of this type which has led to the spread of this method. Years of experience have demonstrated its efficiency.

Potash From Wood Ashes

"Where large quantities of wood are burned, as in mill destructors, it might be possible to profitably extract the potash from ashes. Wood ashes were the original source of potash. The potash content varies largely with the nature of the wood. In the Forest Products Laboratory (Madison) in America the average is given for hardwoods: ash 0.76 per cent.; potash in ash, 20.28 per cent; and for soft woods, ash 0.41 per cent., potash in ash 12.91 per cent.

Wood Pulp and Its Uses

"Wood can be transformed into various products, and the value of the raw material which is wasted in Australia must amount to millions of tons a year; its utilization would open up a very large avenue of opportunities for the creation of wealth. To give an idea of the growth of the viscose industry in America in 1919, there were exported 15,000,000 pairs of silk stockings made from wood pulp.

Excelsior Wood Wool

"The name 'Excelsior' is the name given to fine, curly strands of wood used for a great variety of purposes. It is made from wood waste by rapidly-moving knives and fine steel teeth against a wood bolt. The teeth slit the wood, and the knife, following pares the fine slit of the bolt. Any small pieces up to 14 inches or 16 inches long are used to feed the machines. One machine turns out 6 to 12 cwt. per day. It is used for stuffing mattresses and furniture as a substitute for cotton waste, for filtering, for surgical dressings, for packing breakables, confectionery, toys, etc.

"In America 100,000,000 board feet of timber are annually converted into excelsior. The wood must have a light colour, and a straight grain, and tough fibres. It must also be free from any disagreeable smell, and from oils and gums likely to taint or discolour any substance with which it comes in contact.

"There are species of wood in Australia suitable for making this material, and which are largely wasted at present. The capital outlay on plant is small, and no great technical skill is required. There is a steady demand for a suitable packing material.

Wood Distillation

"Of the many methods of utilizing waste wood, distillation, next to the conversion into alcohol for fuel, seems to offer the greatest possibilities for effectively dealing with a considerable portion of the total waste. Distillation to yield mainly charcoal acetic acid or acetates and methyl alcohol, offers the possibility of developing a large industry and one, moreover, that is in a sense a key industry, for its products are of the utmost importance as a raw material in the manufacture of the various munitions of war.

"It should be possible to establish the wood pulp industry in Australia. The requirements for success are a large supply of cheap wood, cheap fuel, water supply, economical and efficient working of the plant and a market for the products. The large supply is at hand, and at a cost which is negligible, if mill waste is used. The market is the main thing to be considered. To supply Australia's needs alone would not support a big industry. However, wood distillation offers one of the best prospects for dealing with a large portion of the wood waste of Australia, and its prospects are sufficiently good to warrant the establishment, at least, of some small plants in favourable situations to demonstrate the possibilities. One thing is essential, viz., the most efficient type of modern plant.

Sawdust

"The quantity of sawdust produced annually in Australia is immense, though it is quite impossible to estimate it with any degree of certainty. Generally it is correct to reckon 10 to 12 per cent. of the logs sawn is converted into sawdust. This must amount to many thousands of tons. A large proportion of this is burned at the mills, and creates a nuisance by means of the smoke. The amount of sawdust produced in factories in the cities is very small, compared with that produced at the mills, and a fair proportion of this is burned as fuel, and so is not wasted.

"It is a matter of considerable importance to find economical uses for this waste product, and this matter has by no means been neglected. A great deal has been done to find suitable uses for the raw material or economic methods of converting it into valuable products. Sawdust can be put to many uses such as: (a) Fuel, insulating material, packing ice, stable bedding, floor absorbents, polishing and annealing metals, smoking meat, wood floor, purification of gas, covering concrete, stuffing cushions and dolls, filtering, fur dressing; (b) as an admixture with other materials, floor sweeping compounds, artificial woods, composition floorings, paving blocks, linoleum, plastics, blasting powders, fire lighters, soap-

making, fertiliser filling, wallpapers, oatmeal and velvet papers, damp-proof courses, burning of clay products; (c) uses in manufacture of derived products—

"Distillation, fusion with alkali to yield oxalic acid, acetic acid, formic acid, and methyl alcohol. Hydrolysis with acids to manufacture alcohol. In manufacture of carborundum and carbide, producer gas making, manufacture of viscose, manufacture of cellulose acetate, manufacture of paper and boards, manufacture of pyrotechnics, manufacture of nitro-cellulose.

"Many of the above uses are only capable of absorbing small quantities of material. Some of them are industries not developed to any extent at present in Australia. The list is given here, to indicate the great variety of possible uses. In spite of the fact that many of the uses mentioned only consume small quantities, it should be possible, by organization, to develop a large business, and so find uses for a large amount of material now wasted. In fact, it is only by some such organized scheme that such uses become practicable. The main essential is that the sawdust must be supplied at a low price."

●

DESTRUCTION OF FORESTS

The deliberate destruction of forests has arisen from two causes: (1) the destruction of trees to convert them into timber; (2) the destruction of trees and shrubs in the formation or improvement of pastoral and arable land.

In (1) the requirements of engineering and mining works, building, fencing, furniture, etc., have to be provided for. Under (2) the burning off has been incessant, but a fair percentage of dead timber has been converted into household fuel in the vicinity of towns. In Western Australia the cutting of green timber for fuel purposes in the vicinity of the goldfields is, because of the local scarcity of coal, carried out to an extent unknown in eastern Australia. Since the removal of all large timber in the vicinity of the goldfields area is complete, data should be obtainable in regard to the rate of growth of many species in definite areas, natural re-forestation being usually allowed to proceed. In South Australia alone there are large forest plantations of pines.

The urgent need for land for softwoods has been responsible for turning to profitable account land which had always been looked upon and regarded as having no use. No person would ever dream of selecting such land for farming, wheat-growing or of pasturing cattle for market on this hungry country.

Previously to planting this vast stretch with 150,000

acres of pines, the whole area was found to be rugged, stony and quite useless. The vegetation comprised stunted Eucalypts of various species, grass-tree, bracken and underscrub. In such country the bold emu and kangaroo might refuse to take notice of its hungry nature and practically ignore it.

At the present time in the south-east of South Australia about 90 per cent. of those planted are Monterey Pine (*P. radiata*), and the most valuable of the introduced softwoods, the remainder being the following: Cluster Pine (*P. muricata*) and Maratime Pine (*P. pinaster*).

Mt. Gambier pine plantations are solely owned by the Government of South Australia, and a great deal of the timber that had been recently burnt by a bushfire is sent to Victoria, to be made into paper at the Morwell Paper Mills, in East Gippsland.

A few miles from the Victorian border, and through the agricultural districts of Penola, Millicent, Kalangadoo, and Tantanoola to Beachport, Robe and Kingston, on the coast, the Monterey pine has almost changed the district out of recognition. The native trees such as Eucalypts, Acacias, Banksias, Myoporums, and other trees, no longer exist along the sea-coast, this being largely a treeless State. Victoria and New South Wales are now planting largely. Some of our Eucalypts re-afforest rapidly in forest land. The compensating extent of natural re-afforestation is considerable, although sometimes lost sight of.

The removal of the trees of a forest destroys the plant, the maintenance of the plant equilibrium, and interesting changes which, however, cannot be debated at this epigrammatic stage, take place, especially in the particularly thick scrub. The term scrub has something of inferiority in its meaning, referring rudimentally to small or stunted vegetation, whether of trees or shrubs; in Queensland it has become applied to the luxuriant vegetation of the jungle. In New South Wales it is applied more generally to the comparatively sparse vegetation of the more sterile areas, such as those of sandstone and granite. It is also applied to the open forest, in which the species are more gregarious as a rule than those of the brush. The brush consists of well-watered, rich soil areas, chiefly in the coast belt between high and low water mark of the table-lands of eastern Australia, which supports not only arboreal vegetation, but also creepers and climbers of various kinds, and shrubby undergrowth.

The tree vegetation is of the most varied, marks distinguishing genera of families (e.g., *Meliaceae*, *Sapindaceae*, *Saxifragaceae*, *Cunoniaceae*, *Lauraceae*, *Monimiaceae*, *Coniferae*, *Podocarpus*, *Taxaceae*, *Araucaria* and *Callitris*), but rarely includes Eucalypts. The term brush is almost entirely con-

fined to New South Wales and Queensland; in New South Wales it is used extensively; in Queensland the term scrub is frequently interchangeable.

In the brush forests of the northern coastal districts of New South Wales and coastal Queensland upon the whole, the buttress-stem is frequent. Very often these buttresses are of considerable size, nearly directly overhead and quite thin. They are commonly seen in White Fig (*Ficus Cunninghamii*). Look at this, monstrous, deciduous trees, with its giant limbs spreading horizontally over a space of nearly forty yards across, and its short and beautifully-fluted trunk, and those chaste, wall-like abutments which appear as if endeavouring to support the weight of its huge branches. Make an incision in the bark, and an elastic, milky substance exudes in large quantities. Although the roots from the branches never reach the ground, those of the trunk always do, thereby adding to the bulk of the parent stem, giving it a strange and unique appearance.

They form natural struts in the trees in areas of well-watered soil and warm temperature, where the rivalry amongst tree individuals is very keen. Very large trunks run upwards towards the light and, even with their diminished crowns, the leverage of such long stems renders the buttresses essential to the stability of the tree.

Ringbarking

Visitors to Australia will be interested to see the enormous areas of forest land which have been subjected to the process of ringbarking or girdling. In the turn to profitable account of land for arable purposes, the trees are usually removed altogether, but over large pastoral areas the lives of the trees have been sacrificed simply in order that the grass may grow; in many cases not because of the injury caused to the grass by the shade of the canopy, which is often small, but because the tree competes with the herbage for the plant food and moisture.

Most of the trees being durable hardwoods, they die as they stand, and may expose their giant arms and grey trunks for up to half a century and even more, littering the pasture until such time as fungi, beetles, and the elements combine to reduce them to mother earth.

FESTIVAL OF TREES

Of all the features of the Commonwealth Jubilee celebrations, the festival of trees ranked among the most gratifying and potential. It made a direct appeal to an ideal in which

all the people can share, and it should set in motion a new perception of the national value of forest conservation and supply on a large scale, as well as new plantings of Australian species of trees for beautification and scenic beauty. If this is done in the second half century of the Commonwealth, some compensation will be made to Nature for the plunder of the past.

There is much on the credit side already. A good example has been set by the Commonwealth Government in the development of the Federal Capital Territory. Canberra is a place of life and colour because of its trees, a corporate town or city set in a huge parkland. The surrounding mountains contain planted forests and millions of commercial trees, some of which have already reached gigantic proportions.

Australians have come to appreciate better the aesthetic value of our Eucalypts, always amicable and protective with their neutral shades and colours or pastel tints of foliage.

In Australia we have not done enough to preserve these legacies. The axe, the saw, the firestick, and now the bulldozer have been used in excessive love of money and ignorance to destroy these precious trees.

Fortunately, there are signs that natural regeneration has taken place in our forests. With proper care the trees are the natural protectors of the water catchments. Their destruction in the past has incurred the retribution of Nature in the form of soil erosion and siltation of the rivers and estuaries.

The Planting of Trees means more than conservation of forests for their economic value; it calls for progressive replanting by private owners, as well as public bodies to have community forests near every town, renewal of arbor days in schools, planting of more trees along the highways and roads, also around farms and homesteads, as well as in suburban parks and gardens. It might be truly said that the character of a nation should be measured by its tree culture. In some of the older countries it has been the custom or law for every man who cuts down a tree to plant two in its place. It is a pity this settled rule of action is not a universal proposition.

SHADE AND ORNAMENTAL TREES

The attention of shade and ornamental trees is an entirely different matter from the care of forests. The forester grows the tree to be cropped for timber, bark, oil, etc.; the landscape gardener grows it for shade, general effect and beauty of form. The selection of trees before planting and their succeeding treatment depend largely on these considerations.

The great need of planting trees for timber, firewood, shade, and shelter is slowly being brought to realization. The timber supply of the world is being exhausted, and many countries are now taking steps to moderately conserve existing forests and to replace trees which are felled for timber and firewood. Foremost of the nations in this great work are France, Germany, Russia, Italy, United States of America and Denmark. Each maintain schools of forestry, with experimental stations attached, where students may learn the science of forest husbandry. Much attention has been given to this branch of work in Great Britain, Canada, and Australia.

Extirpation of Forests

During the early stages of settlement in new countries trees must be felled to make room for farm crops, and to improve the grass pastures; but, as a rule, little or no thought is given to the future, and it is soon found that many districts are so denuded of trees that the timber, firewood, and shelter wants are exhausted.

Promiscuous Forest Destruction

The wholesale destruction of forest trees has removed the principal source of leaf mould and humus which enriches the soil, and enables it to act somewhat similar to a sponge, by expediting the soakage of the rain into the soil and retaining it there for a considerable time. This supply of water replenishes the springs and streams and directs their flow during the year. When forests are destroyed, streams flow at intervals; rain sweeps over the surface, carrying away much of the rich topsoil to lower levels. Again the streams are flooded in winter, when water is not so essential, and low in summer, when it is needed most. The absence of trees enables the wind to sweep without interruption over the surface of the soil, thus very greatly increasing the amount of soil moisture loss by evaporation.

Tree Conscience Must be Established

The creation of a public feeling towards planting and preservation of trees is an urgent want. This feeling is being supported by the writings of experts and enthusiasts in the public press. But much more is required; the matter is of such public concern that it necessitates all who realize its gravity to lose no opportunity of reminding and educating the public.

Those who are doing something to popularise our tree life in the community are doing something very worth while.

GLOSSARY OF BOTANICAL TERMS USED

- Abnormal*, deviating from rule, as when stamens are opposite the petals instead of being alternate.
- Aculeate*, armed with prickles.
- Acuminate*, tapering to a gradually diminishing point.
- Acute*, distinctly and sharply pointed.
- Adnate*, attached the whole length.
- Albus*, dead white, without lustre.
- Alkaloid*, a substance soluble in water of the nature of soda, etc.
- Alternate*, placed on opposite sides of the stem on a different line.
- Anther*, the pollen-bearing part of the stamen.
- Antiseptic*, preventing putrefaction.
- Aril*, an outgrowth of the coat of the seed.
- Australis*, occasionally applied to plants which are natives of warmer countries even if not from the Southern Hemisphere.
- Axillary*, in the axil formed by leaf or branch.
- Bark* (Cortex), the outer cellular and fibrous covering of the stem, separable from the wood in Dicotyledons.
- Bipinnate*, a compound leaf, divided twice, in a pinnate manner.
- Bole*, the trunk of a tree.
- Bract*, the modified leaves intermediate between the calyx and the normal leaves.
- Bracteole*, a small bract.
- Calyx*, the outermost of the floral envelopes.
- Campanulate*, shaped like a bell, as the flower of Harebell.
- Capsule*, a dry, dehiscent seed-vessel.
- Carpel*, a single cell or separate cells of the ovary or fruit.
- Caudex*, the axis of a plant, consisting of stem and root.
- Cilia* (Cilium), short, stiff hairs fringing the margins of a leaf; also vibratile hairs of moving spores.
- Cluster*, a compact arrangement of flowers.
- Cocci*, the one-seeded carpel of a fruit, consisting of many joined carpels, which separate from each other when ripe.
- Compressed*, flattened laterally or lengthwise.
- Contracted*, drawn together.
- Cordate*, heart-shaped, applied to leaves having the petiole at the broader and notched end.
- Coriaceous*, leathery.
- Corolla*, the interior perianth, composed of petals, free and united.
- Cortex*, the bark or rind.

Corymb, a flat-topped or merely convex and open flower cluster.
Crowded, to press together.

Cuneate, wedge-shaped, triangular.

Curved, a bending without angles.

Cyme, a flat-topped flower cluster.

Deciduous Trees, those which lose their leaves annually.

Decurrent, applied to leaves or leaf-stalks when their edges are continued down the stem.

Defoliation, the fall of the leaves.

Dentate, sharply notched, serrate.

Dilated, to enlarge or extend in all directions.

Discolor, used when the two surfaces of a leaf are unlike in colour.

Double Flower, when the organs of reproduction are converted into petals.

Drupe, a succulent fruit with a hard stone which usually contains one seed.

Duramen, heart-wood of Dicotyledonous trees.

Elliptical, shaped like an eclipse, oblong with regular rounded ends.

Elongated, to draw out at length.

Emarginate, having a notch cut out, usually at the extremity.

Endemic, native to a particular country or region.

Entire, without toothing or division, with even margin.

Envelope, Floral, the calyx and corolla.

Epicarp, the external layer of a pericarp.

Epiphytal, relating to plants which grow on other plants.

Falcate, sickle-shaped.

Fibrous, composed of numerous fibres, as some roots.

Filament, the stalk of an anther.

Fissile, tending to split, or easily split.

Flexuose, bent alternatively in opposite directions.

Folded, in vernation when the two halves of a leaf are applied to one another.

Foliation, the development of leaves.

Follicle, a fruit consisting of a single carpel, splitting open when ripe on one side only.

Frond, the leaf-like organ of Ferns bearing the fructification; also applied to the thallus of many Cryptogamic plants.

Furrowed, having longitudinal grooves or channels.

Gland, an organ of secretion consisting of cells, and generally occurring on the epidermis of plants.

Hilum, the base of the seed to which the placenta is attached, either directly or by the means of a cord to the mark at one end of some grains of starch.

Indefinite, applied to inflorescence with centripetal expansion; also to stamens above twenty, and to ovules and seeds when very numerous.

Indumentum, any covering, as hairiness.

Indusium, an outgrowth of the epidermis covering the sorus.

Inflorescence, the disposition of the flowers on the floral axis.

Internode, space between two knots, or nodes from which the leaves grow.

Involucre, whorl or bracts surrounding a flower or inflorescence.

Irregular, abnormal, not straight, as a line.

Lanceolate, tapering at each end, narrow.

Legume, the seed vessel of *Leguminosae*.

Ligule, a thin scarious appendage.

Linear, very narrow leaves, in which the length exceeds greatly the breadth.

Lobe, any division of an organ or specially rounded division.

Loculicidal, fruit dehiscing through the back of the carpels.

Lomentaceous, applied to a legume or pod with transverse partitions, each division containing one seed.

Lyrate, a pinnatifid leaf with a large terminal lobe, and smaller ones as we approach the petiole.

Medullary Sheath, sheath containing spiral vessels surrounding the pith in Exogens.

Medullary rays—a term for the whole of the primary bast bundles.

Membrane, the wall of a cell, or a thin covering formed by flattened cells.

Mesocarp, middle covering of the fruit.

Mesosperm, inner covering of the seed.

Micropyle, the opening or foramen of the seed.

Midrib, the principal nerve in a leaf.

Naked, applied to seeds not contained in a true ovary; also to flowers without any floral envelope.

Nodes, joints or thickenings along the branchlets (marking the origin of leaves).

Nucleus, the body which gives origin to new cells; also applied to the central cellular portion of the ovule and seed.

Obcordate, inversely heart-shaped.

Oblique, slanting, of unequal sides.

Oblong, much longer than broad, with nearly parallel sides.

Obovate, inversely ovate, broadest towards the apex.

Obovoid, somewhat obtuse.

Obsolete, imperfectly developed or abortive; applied to the calyx when it is in the form of a rim.

Obtuse, blunt or rounded at the end.

Operculum, a lid or cover which separates by a transverse line of division.

Opposite, applied to leaves placed on opposite sides of a stem at the same level.

Orbicular (circular)—of a flat body with a circular outline.

Oval, elliptical, blunt at each end.

Ovoid, egg-shaped.

Ovule, the young seed in the ovary, the organ which after fertilisation develops into a seed.

Palmatifid, applied to a leaf with radiating venation; divided into lobes to about the middle.

Panicle, a loose compound flower-cluster.

Parasite, attached to another plant.

Pedicel, an ultimate flower-stalk, the support of a single flower.

Peduncle, a primary stalk bearing one of the many flowers.

Penniveined, pinnately-veined.

Perianth, the floral envelopes, calyx and corolla, or both.

Petals, the leaves forming the corolline whorl.

Petiole, the footstalk of a leaf.

Persistent, remaining till the part which bears it is wholly matured, as in the leaves of evergreens.

Phyllode, a leaf-stalk which assumes the shape and function of a leaf.

Pinnate, leaflets arranged along both sides of a midrib.

Pistil, the female organ of a flower, consisting of ovary, style and stigma, when complete.

Papilionaceous, corolla composed of vexillum, two alae, and carina, as in a pea.

Pendulous, applied to ovules which are hung from the upper part of the ovary.

Pericarp, the covering of the fruit.

Pollard-Trees, cut down so as to leave only the lower part of the trunk, which gives off numerous buds and branches.

Pollen, the powdery matter contained in the anther.

Posterior, applied to the part of the flower placed next to the axis; same as superior.

Prosenchyma, fusiform tissue forming wood.

Pubescent, woolly or hairy.

Pulvinus, cellular swelling at the joint where the leaf-stalk joins the axis.

Putamen, the hard endocarp of some fruits.

Raceme, an elongated flower-cluster.

Receptacle, the flattened end of the peduncle or rachis bearing numerous flowers in a head; applied also generally to the extremity of the peduncle or pedicle.

Recurved, bent back.

Reticulate, netted.

Revolute, having the margins or apex rolled backwards.

Rhachis, the axis (stalk) of an inflorescence, or of a compound leaf.

Rhizome, a stem creeping horizontally, more or less covered by the soil, giving off buds above and roots below.

Rhomboid, quadrangular with the lateral angles obtuse.

Rugose, covered with wrinkles.

Sature, the part where separate organs unite.

Scape, a leafless floral axis or peduncle arising from the ground.

Segmental, forming, or resembling a segment.

Sepal, each segment comprising a calyx.

Serrated, with saw-like toothed edges.

Sessile, destitute of a stalk.

Siliqua, a long pod similar in structure to the silicula.

Simple, not branching, not divided into separate parts; Simple fruits are those formed by one flower.

Spathe, a large bract enclosing a flower-cluster, usually a spadix.

Squarrose, rough or scurfy.

Stamen, a male sporophyll in a flower.

Standard (*Vexillum*), the upper or posterior petal of a papilionaceous flower.

Stigma, that part of the pistil or style which receives the pollen.

Stipitate, having a stipe or special stalk.

Strobile, an inflorescence largely made up of imbricated scales.

Style, the usually attenuated part of a pistil or carpel between the ovary and the stigma.

Sub-globose, nearly globular.

Superior, applied to the ovary when free, i.e., placed above the calyx; to the part of the flower placed next to the calyx.

Terminal, the end part.

Tomentose, woolly, hairy, pubescent.

Torulose, cylindric with swollen portions at intervals.

Torus, the receptible of a flower, that portion of the axis on which the parts of the flower are inserted.

Tripartite, divided into three parts.

Triplernerved, threefold, with a midrib dividing into three, or sending off a strong branch on each side above the base of the blade.

Truncate, shortened, as though cut off at an end.

Tuberculated, beset with knobby projections or excrescences.

Turbinate, cone-shaped, shaped like a top.

Umbel, an arrangement of flowers, in which a cluster of small flower stalks spring from the same point like the ribs of an umbrella.

Urceolate, hollow and contracted at the mouth like an urn or pitcher.

Valve, a piece into which a capsule naturally separates at maturity.

Ventral, applied to the carpel, which is next the axis.

Ventrol, applied to the carpel, which is next the axis.

Vernation, the arrangement of the leaves in the bud.

Verticil, a whorl, parts arranged opposite to each other at the same level, or, in other words, in a circle round an axis. The parts are said to be Verticillate.

Vexillum, standard, the upper or posterior petal of a papilionaceous flower.

Viscid, sticky, glutinous.

Villose, a coating of long weak hairs.

Whorls, the arrangement of organs in a circle round the axis.

Wings, the two lateral petals of a papilionaceous flower, or the broad flat edge of an organ.

Xylem, the wood portion of a fibro-vascular bundle, formed usually thick-walled cells.

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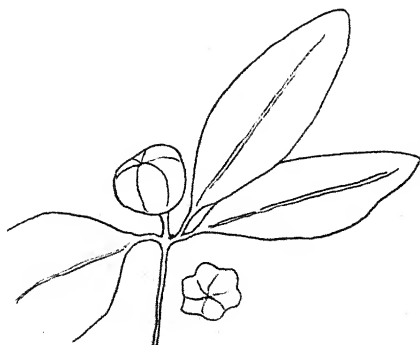
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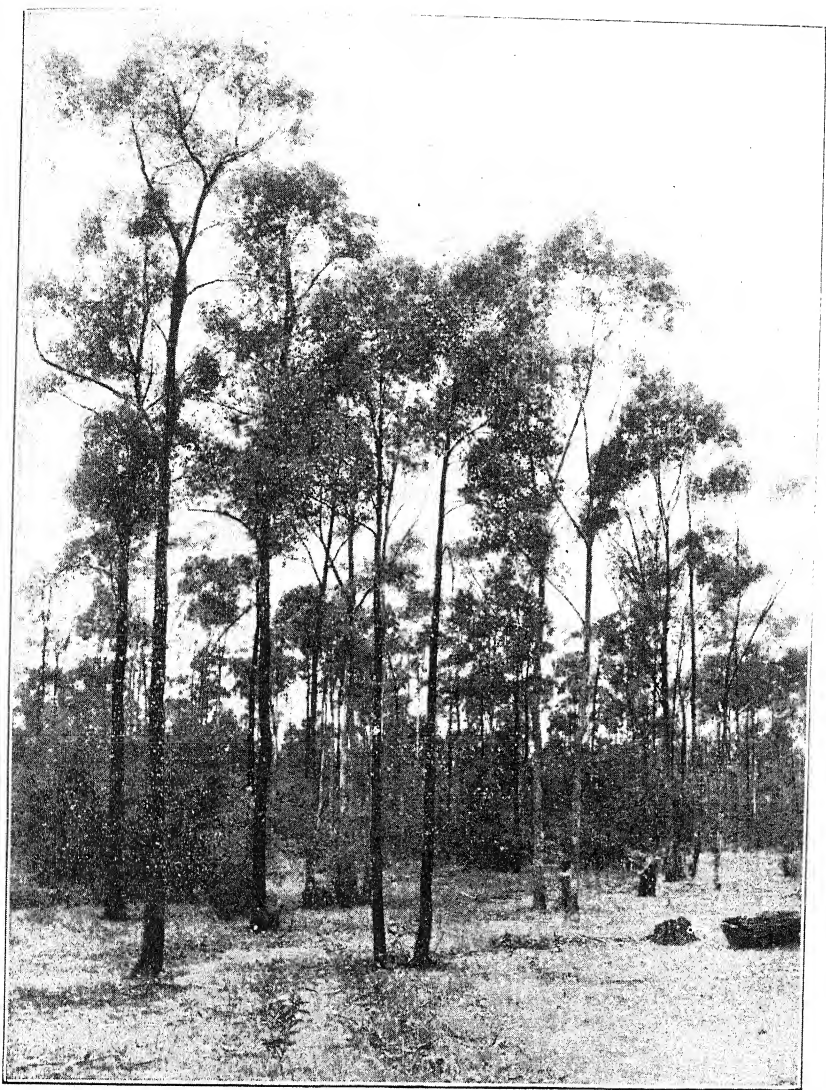
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Dissilaria baloghoides



Forests Dept., Melbourne, photo.

Euc. Sideroxylon



Australian National Travel Association, photo.

Along the Timber Track